



American Forestry

VOLUME 28

FEBRUARY, 1922

NUMBER 338

A VANISHING TRAIL

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SHERLOCK HOLMES OF THE FORESTS

✧ ✧

THE ROYAL PALM

✧ ✧

THE SNELL BILL HEARINGS

✧ ✧

TREES IN WINTER

✧ ✧

FEDERATED OUTDOOR CLUBS

✧ ✧

SOUTHERN EVERGREEN SHRUBS

✧ ✧

THE BADGERS AND WOLVERENES

✧ ✧

TOWN FORESTS

The American Forestry Association

Washington, D. C.

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Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watershed; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people, that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 780,000 people; pay \$667,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions, that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal cooperation with the State, especially in forest fire protection.

State activity by acquisition of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and encouragement and extension individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquisition of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Clear Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal National and State appropriations for this work.

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WASHINGTON, D. C.

PERCIVAL SHELDON RIDSDALE, Editor

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CHANGE OF ADDRESS

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"THE HALL OF FAME FOR TREES"



(Photograph by Frances Benjamin Johnston)

THE TREATY OAK

This splendid oak tree stands on the grounds of the Woman's National Foundation in Washington, D. C., having given the name of "Oaklawn" for generations to the estate that owned it. A magnificent specimen of its kind, it has a diameter of from seven to nine feet at the thickest part of the trunk, and is said to be several hundred years old. Though the Foundation intends shortly to erect a group of buildings on this site, the oak tree will be preserved, the Board of Governors having declared that they want it kept as a symbol of the enduring

strength which the infant Foundation is expected to attain. Tradition connects the tree closely with the early history of Washington and claims that under this oak, which stands on a hill commanding the approach to the city, foregathered the Indian Chiefs to draw up the treaty which ended forever the bloody strife between the whites and the redmen in this vicinity. It was nominated for the Hall of Fame for Trees with a History last September by Mrs. Clarence Crittenden Calhoun, the president of the Woman's National Foundation.

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THE VANISHING TRAIL

By Arthur Newton Pack

European Commissioner of the American Forestry Association

This, the third of the series of articles written by Mr. Arthur Newton Pack, who, as Commissioner for the American Forestry Association, visited European countries to study forestry conditions, describes the aftermath of cuttings in France by the Twentieth (Forestry) Regiment. In the March issue of American Forestry there will be an article by Mr. Pack on conditions in Germany.—Editor.

MOST of us at one time or another have witnessed the dreadful aftermath of lumbering operations in America; a tangle of discarded trunks, tops and branches with pillar-like stumps projecting through, a raging conflagration, and then that utter desolation which can only be compared with the European battlefields. But if one sets out to view the cutting of the 20th Regiment of American Engineers (the Forestry Regiment), in France with such a picture in mind, he is due for a decided surprise. It is a long trail, the pursuit of that particular branch of the A. E. F., and its markings are growing continually harder to find, particularly without the guidance of such men as Colonel W. B. Greeley or Colonel Henry S. Graves, who helped to make it. Yet its very dimness is one of the crowning achievements of American lumbering.

Thousands of railway ties and timbers for the A. E. F. were cut in the fine old oak and beech forests of the Touraine and southern Brittany, and all without leaving a single acre of devastated waste. It was done by the cutting of selected trees previously marked by the French forest rangers according to precepts and practices more than a century old. First just a few trees are removed to allow the light to filter through the leaf canopy and permit new seed to germinate in the soil—the “seeding cut,” they call it, then, several years later, a few more old trees to give the young ones a better chance; and finally, when the new forest is safely established

everywhere under the old, down come the remaining mother trees and it is only necessary to await the beginning of the next cycle.

What the American lumbermen did was simply to perform those various selective cuts, and Nature, unhindered in her regular course, almost immediately hid the scars. Of course it involved no mean skill, for France's limited forest area permitted no wastage, even in war time. It wasn't so much a case of low stumps as no stumps, for the trees were cut practically level with the

ground, and in addition great care had to be taken that the trees should fall in exactly the proper direction so as to do as little injury as possible to the young growth beneath. Everywhere the French officials and rangers seemed pleased with the American work.

Naturally they showed no surprise. Lumbering has for generations meant to them just this kind of scientific cutting. While, from the American viewpoint we marvelled when they indicated as the site of a former logging camp not a great bare clearing, such as we see in America, but a particular grove of trees that appeared no different from the surrounding forest, the real never-ending wonder to the ordinary ranger was the memory of all the wealth and variety

of food of which he had partaken in the mess shack that had stood between yonder two oaks. Then often he would lead the way a few yards to one side and point to several



INSTEAD OF DEVASTATION AND WASTE—THIS

The photograph above shows how many of the cuttings made by American lumbermen in the hardwood forests of France look today. In scientific forestry these represent different stages in opening the forest to admit light for natural reproduction.

large concrete slabs almost hidden by a new crop of seedlings. "Here stood the shower bath," and so saying he would express the acme of his admiration and wonder at the efficiency of American lumbering.

Nevertheless, the picture of this new kind of "cut-over" land, indicates to us not only what American lumbering can accomplish, but something of what will surely evolve in America with development of a real forest policy—something of the stately beauty of the permanent forests made economically practicable through



A FINE POINT IN CONSERVATION

This fine oak on the edge of one of the American cuttings near Blois was reserved because its high grade timber was thought to be more valuable for making veneer than for bridge timbers or railway ties.

the location of the producing areas near our great eastern markets for lumber consumption, and something of how the higher costs of scientific cutting may be met, not by the home builder, but through the saving of transportation costs which now make up more than half the price of all wood.

Over in the Vosges Mountains we find much the same story. Upon the presentation of proper credentials from the Ministry of Waters and Forests the regional chief greeted us with the utmost French courtesy, but at the statement that we wished to visit certain American cuttings a look of real disappointment crossed his face. "Monsieur," he said, "I should be only too pleased to take

you there, but as it happens I have just completed a trip through the region, and so rapidly has the new growth advanced that I was myself unable to distinguish the exact localities." It seemed, however, that a little farther west, in the fir country upon the very border of



CAN AMERICAN LUMBERMEN BEND THEIR BACKS?

A French district forester and one of his rangers standing upon the stump of a large oak tree cut by the A. E. F. lumbermen. Here where the young oak seedlings had already obtained a good start the forest authorities permitted the last of the older forest to be removed.

Alsace, the cuttings had been heavier, the immediate necessity for large quantities of timber for the trenches of the Toul Sector having made necessary what he termed abusive logging. Here, to be sure, we found the scars readily enough especially under the guidance of two rangers who had personally chosen and marked the trees to be cut. Sadly they indicated the almost bared patches. Two few trees had been left, they said, and the wind had since blown them down, but we saw only the broken or uprooted stumps. Trunk and branches had some time since been removed for sale at a small loss in order to reduce the fire hazard. How casually they referred to long standing forestry principles which we are just beginning to apply.

The trail of the 20th Engineers eventually brought us to the pineries, south of Bordeaux, plantations made two hundred years ago to protect the inland vineyards from the drifting dune sand. Here had been several good-sized mills, an American logging railroad, and complete American management. The men had worked as in our own pine country, clean cutting the forest block by block. Except, perhaps, for a little extra care in leaving low stumps, and for the possibility of utilizing smaller top logs, they might have been at home and these might have been the forests of South Carolina, or Mississippi or Louisiana. Yet mile upon mile of thick new growth

covering nearly every acre they denuded testifies to something different—what is it? Simply thorough fire protection. On a light soil almost any forest will by natural laws tend to reproduce itself, not always in exactly the same species, if the species are at all mixed, but effectively nevertheless. One fire immediately following



WHAT FIRE PROTECTION CAN DO

Effective fire protection was practically the only thing necessary to obtain the heavy regeneration shown in this picture of an American cutting in the Maritime Pine region.

the cutting of the old forest is often sufficient to destroy the seeds left in the soil, and successive burnings, such as so often occur in the cut-over regions of our lumbering states, invariably kill all chance of natural reproduction. Fire protection is the foundation of French forestry.

Today the former American saw mills in France have all been dismantled. Our heavy, rapid cutting equip-

ment did not generally appeal to the French lumbermen, who feel that because of their limited forest resources they can better afford the extra time required by a thinner saw than the waste of wood made by the wide American kerf. The mill sites, moreover, were not chosen with a view to suitability to the peace time needs of French industry, and here in the Landes one may see today here and there a hulking framework which it has proved too expensive to salvage. Camp sites and parade grounds too may still be recognized because the continued trampling of the soil prevented the regrowth. A year ago, however, the forest ministry sowed these spots anew,



ONCE A SAW MILL OF THE 20TH ENGINEERS

The use of the mill site and surrounding camp prevented natural regeneration, but now the entire area is covered with little Maritime Pines about two inches tall, grown from seeds sown by the French.

and such a crop of tiny seedlings are now pushing up even between the very timbers of the mill frames, that within a few years even these last relics of American lumbering in France will have vanished.

ANNOUNCEMENT

The Annual Meeting was held on the 26th of January. At that time this issue of the magazine was in press. The report of the proceedings, resolutions, etc., will be printed in the March issue, which will also contain the financial statement of 1921.

A GERMAN FORESTER'S VIEWS

From a Letter Written by

DR. C. A. SCHENCK

When Mr. Arthur N. Pack went to Europe last summer as Commissioner for the American Forestry Association, to study forestry conditions and forestry needs of Great Britain, France, Belgium and Germany, he took with him a letter to Dr. C. A. Schenck, of Hesse-Darmstadt, a well-known forester. Dr. Schenck spent many years in the United States and conducted the Biltmore Forest School. Returning to Germany several years ago, he still keeps in touch with American forestry conditions and his views, here expressed in a letter to the Editor, are interesting.—Editor's Note.

On July 21st you have given a letter of introduction to me to Mr. A. N. Pack, when he went on his European errand of forest investigation. Mr. Pack may have told you, in the meantime, that he gave me, instead of I myself giving it to him, the most pleasant time I have had in many a long year. We traversed the old stamping grounds of Sir D. Brandis and of Sir Will. Schlich, later on those of the Biltmore Forest School, in Southwest Germany, and we had a glorious time on the spree!

Prior to Mr. Pack's visit, I had abandoned all thought of forestry. What use is there—that was my daily slogan—of nursing seedlings so long as children remain absolutely un-nursed? What use is there of forest protection so long as thousands of children remain without protection? And what is the sense of estimating timber so long as we neglect to estimate the benefits accruing from that old and decrepit stick of timber which stood, 2,000 years ago, on Golgotha, and which had the shape of a cross?

Those were my thoughts, with the result that I declined any participation in forestry work.

Yet when A. N. Pack came to me, when we visited the forests, when we talked shop, 25 hours a day—when I licked blood—I changed my mind rather abruptly.

Blame me if you can!

Fortunately, the condition of my wards, the German children and notably the children in Darmstadt, has much improved in the course of the last twelve-month. The cheeks are reddening, the eyes are brightening, the little stomies are filling; the fathers, factory hands, are fully employed, and help on a large scale is certainly today less needed than it was heretofore, before the American Quakers and many other good Americans came to the rescue.

Indeed, Mr. Pack and I, touring through woods and villages and cities, were struck by what "prosperity" seemed to prevail everywhere.

Of all the resources which the war has left to Germany the forests stand most intact. In the Spessart, in the Black Forest, in the Odenwald, in state, private and city forests, there is approximately the same stand of timber which was there prior to 1914. There are some large-sized cuttings, in lieu of the small coupes otherwise en vogue in Germany; the most accessible timber was removed rather than trees more evenly distributed over the

entire areas. Certain species, like white ash, have been badly reduced by the requirements of the airplane. Yet on the whole no harm done! Nevertheless, without these forests, Germany would have been beaten in 1915. The forest was yielding timber for guns and gunstalks, cellulose for high explosives, fuel in lieu of coal, fibre bandages for the wounded, lumber for the trenches, food for horses and cattle and goats, oil, (beechnut oil) in lieu of olive oil, turpentine and rosin (on a small scale I admit), and comfort to many a troubled mind finding refreshment in the forest air, in nature; also lots of work was made available for many people who were without employment. Indeed, if Germany had won the war the foresters might have claimed that the German forests were responsible for the victory. Never have the forests been proving their economic worth, in an emergency, to a greater extent than it was done in Germany of late years, even today! Foodcrops alone won't help; forests, forests *well distributed* all over the country are an economic necessity, in any emergency. How would the U. S. A. have stood, during the war without them? What would the people do if there were—owing to strikes or for other reasons—a sudden interruption of the coal supply?

Naturally, I have been much interested in the Capper—and Snell—bills now before Congress. Queerly, we have tried, in America, to establish forestry always where its establishment was of least economic *direct influence*. So in the 80s of the last century, in the prairies; who thinks of prairie planting such as was then advocated, in this year 1921? So in the 90s, when the most remote mountain fastnesses in the Far West were set aside as "forest reserves."

So today when we try to perpetuate the timber supply where it still exists, in the extreme West and South, instead of engaging in *constructive* forestry close to the densely settled sections of the East, where there are millions of acres lying unproductive—because they are fit for nothing but for constructive forestry.

I do not believe that any good can come from forestry-compulsory laws, or from forestry practiced at the land-owner's *loss*. At 50 cents a bushel, no wheat will be produced, all congressional legislation or Lenine legislation in Russia notwithstanding; nor will cotton be produced at 5 cents a pound. The people must pay a price at which it pays to produce wheat and cotton.

Now then if the good people of the U. S. A. desire to have timber and fuelwood they must be willing to pay a price for timber and for fuelwood at which it pays to raise them, by means of constructive forestry.

In other words, if the people want to have forestry the people will have to foot the bill; the people will have to create conditions of forest protection, forest taxation and of wood prices at which forestry investments are good investments.

Do you know of any U. S. A. forester who has placed his own money, on a considerable scale, in a second growth of American forests?

I do not know the forester who has done it.

We should never tire of telling the people of the U. S. A. that there cannot be any American forestry on a large scale unless it be at their expense, directly and indirectly, Capper fashion or Snell fashion, or in any other fashion.

The greatest enemy of forestry is cheap lumber and cheap fuelwood. When the German owner of woodlands makes a clean cut he nets per acre some \$500 gold; it is easy for him, then, to set aside \$10 for a second growth which, tho heavily taxed, is sure to be immune from fire, sure to develop into a first growth of the same money value, and sure to yield, from its thirtieth year on acre-returns of \$50 or so periodically, by way of thinnings. *How does the American forest owner stand?*

In Germany the price of timber is maintained by what is, in fact, a huge trust in which the various states as owners of forests, are the leading stockholders. No more timber and fuelwood is cut, annually, than the equivalent of the annual timber growth. What about the chances of a "timber trust" in America?

In addition, all German forests are and have been made accessible by public railroads and public macadam roads, on a gigantic scale. The people have been paying and are today paying for forestry. *That's why* there is any.

Do not misunderstand me. Not for a moment do I wish to advocate the importation of German forestry, or of French forestry, in the U. S. A.

I want to illustrate, however, the fact that every country on this globe has exactly as much forestry as its inhabitants have been willing to pay for.

For the U. S. A. none but American forestry will do.

Colonel Greeley, I am told, claims that 75 per cent of American forestry is forest protection from fires.

Colonel Greeley is wrong; 95 per cent of all American forestry, in my opinion, based on 20 years of practical work in the U. S. A., is forest fire protection. Indeed, no power other than fire can prevent a forest, *id est*, some kind of a forest, from establishing itself on cut-over land. "Some kind of a forest" may not be what the forest enthusiasts desire to obtain; they want a forest as good as, or better than the primeval. Are they also willing to foot the bill?

If the people want the biggest merchant marine, the people must pay for it; if they want the best railroads, they must pay for them; if they want the best forestry, well, they must pay for it; pay they must, either as owners of marine and railroads and forests; or as users

of marine and railroads and forests; or as both owners and users; and it makes no difference whether the regime be socialistic, or czaristic, or democratic. There is absolutely no escape from paying the bills.

I have been dilating on this topic because it has been, for many years, my hobby topic. Like a canary bird, I know only one song to sing. If forestry is anything less than commonsense applied to cutover and standing woodlands, there is no chance for it in the U. S. A. Commonsense tells us that investments, to be made on a large scale, must be safe and remunerative. There are no better business men in the U. S. A. than are the lumbermen. If none of them is practicing forestry the reason lies in the unremunerativeness and in the unsafety of the investment. Amen.

This winter I hope to be able to refresh my mind on the new issues of American forestry. The Association periodical I am reading regularly, also "Hardwood Record," copies of the American Lumberman, of the Timberman, of the Lumber World Review, are reaching me from time to time. All of this is not enough. I desire to have a more personal touch with the things going on, and I shall be ever so thankful if you will direct to me any American interested in forestry when he pays a visit to Germany. I'll try my best to show to him that German forestry is the product of high prices, of a timber trust, of fine public roads in the woods, and of a ready market for fuel wood.

The Missouri Forestry Association

The Missouri Forestry Association was formally organized at an extremely interesting and enthusiastic meeting held at the Missouri Athletic Association on December 7th, and Hermann von Schrenk, timber engineer and plant pathologist, a director of the American Forestry Association and a leader in the forestry forces in the United States, was elected president. Dr. von Schrenk presided at the meeting, attended by representative men and women from all over the state.

The object of the association, as announced in the constitution adopted, shall be "to advance the public importance of timber crops in the economic life of local communities and the whole State and nation, so that due provision will be made for insuring particularly within Missouri a proper area of forests so maintained and cared for as to furnish a supply of timber sufficient for future needs and to make available all the other benefits of health, pleasure and profit which forests afford."

The by-laws provide for the usual association officers, who are also members of an advisory council consisting of twenty persons. The membership of the organization is divided into three classes, all enjoying equal rights and privileges.

The following officers were elected: Dr. Hermann von Schrenk, St. Louis, President; J. W. Fristoe, St. Louis and Mrs. Marie Turner, Kirksville, vice presidents; W. P. Grumer, St. Louis, Treasurer and Prof. Frederic Dunlap, Columbia, Secretary.

SHERLOCK HOLMES OF THE FORESTS

By G. H. Dacy

A DECIDED abatement in forest fires of incendiary origin has been consummated in the National Forests of California since the establishment of arson squads and forest detective service among the organized forest rangers of the Golden State. Previous to the inception of this Sherlock Holmes service of the forest primeval, anywhere from 150 to 300 man-started fires broke out in the government timberlands each fire season. Last year, as a direct result of the arson squad activities, the total number of incendiary fires was reduced to 28 and all evidences point toward the potential reduction of this source of fire evil to a negligible amount.

In many instances, the neglect and carelessness of hunters, fishermen and campers are responsible for the outbreak of forest fires of human origin. Despite that the national woodlands are liberally posted with signs warning tourists and campers to exercise special care in putting out camp fires and in the general use of matches and

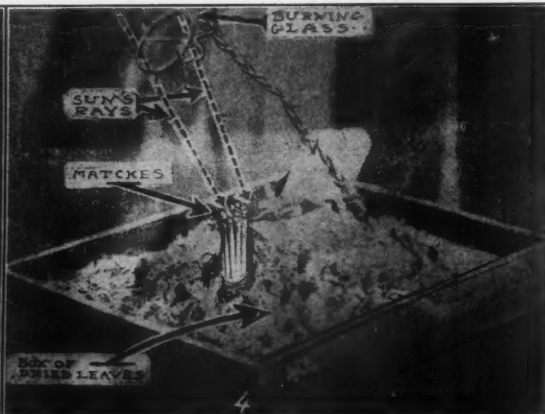
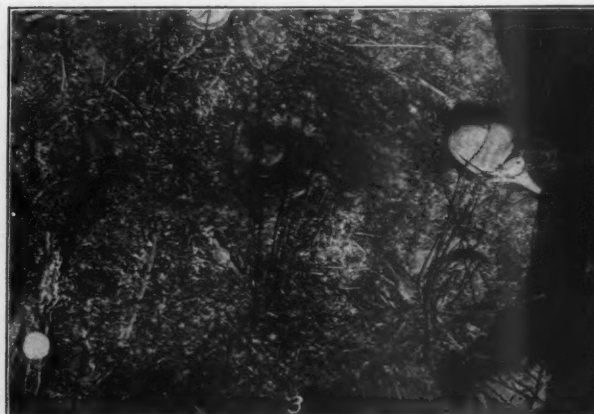
lighted tobacco, innumerable cases of woodland blazes have emanated from sheer negligence. During the fire season from June until November, many of the western forests are so dry that a single match carelessly discarded from a passing automobile may cause a destructive conflagration which may destroy thousands of feet of valuable lumber in the making. It is not that Uncle Sam finds pleasure in running to earth and punishing such offenders, his emissaries simply function along those lines in order to impress upon all forest users the basic importance of exercising every effort to prevent fire and that unless they practice such precautions, trouble is in store for them.

The forest rangers who compose the arson squads have been trained in modern methods of sleuthing and they employ all the arts and artifices of the metropolitan plain-clothesmen in assembling and interpreting evidence and in gathering data which will lead to the identification

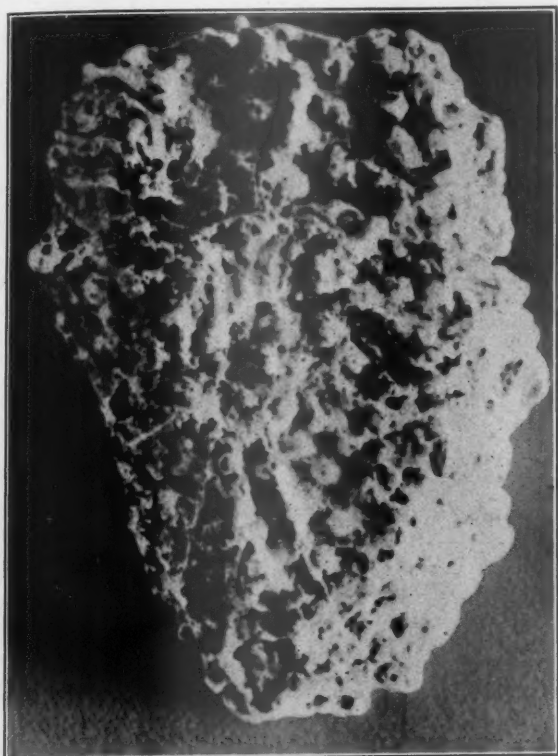


BURNING GLASS USED TO START FIRE—INCENDIARY CAPTURED

These photographs indicate developments in detective work worthy of the best that Sherlock Holmes ever did. No. 1 shows the trackers finding the "plant" of an incendiary fire in the forest. No. 2 shows a bunch of partly burned matches. No. 3 shows the wire which must have held something to set the matches on fire. A search in the ashes revealed a burning glass. They reconstructed the plant as shown in No. 4 and ultimately traced, captured and convicted the criminal.



and location of the transgressors. In these detective activities they make use of water glass casts as well as impressions made by the use of dental plaster, plaster of Paris and ordinary cement in making models of the foot tracks of both men and beasts. They carefully collect and preserve all articles found around the abandoned



FROM HEEL TRACK TO JAIL

Very faint was the impression of this heel mark near where a forest fire was started but it was sufficient to give the forest detectives a trail which they followed until they captured the man who had started the fire.

camp fire or point where the forest fire started, which, subsequently may be examined for finger prints. They search for unburned matches, the charred remains of man-started fires, and other mediums used in kindling the flame.

One party of tourists who started a disastrous forest fire through carelessness with a campfire were tracked, caught and punished by means of a laundry mark on a handkerchief. The handkerchief was found near the outbreak of the fire. After several day's investigation, a laundry was located in a neighboring city that identified the mark on the handkerchief and furnished the home address of the culprits. Scraps from discarded envelopes and letters have led to other convictions. Frequently, peculiarities of horse hoof conformation or unusual method of shoeing as well as extraordinary human foot tracks or automobile tracks have aided the forest guardians in capturing offenders who have caused forest fires. Not infrequently, disgruntled stockmen whose flocks or herds have been driven from the grazing lands in the

National Forests because of trespass seek to wreak revenge on the federal foresters by starting a series of fires. Occasionally, some of these fires are so cleverly arranged and set off, that it takes weeks of earnest effort and investigation to track the culprits to their lairs.

Three years ago in one of the California forests, 15 incendiary fires broke out the same day at different parts of the timberlands. The forest lookouts reported that they were certain that no human beings had been in the vicinity of the spots where the flames developed that day. After painstaking and detailed search, fire remnants were found near the outbreak of one of the fires which indicated that an ingenious method of set-up had been devised and followed in the starting of some of these blazes. A glass lens was found which was so mounted in a wire



THIS CONVICTED A STOCKMAN

A plaster cast of a hoof print of a horse found near the spot where a forest fire started resulted in a malicious minded stockman who set fire to a California forest being sent to jail.

frame that terminated in a long arm that it could be stuck in the ground in direct line with a pile of matches and dry woodland debris. The glass was so arranged that when the sun reached a certain point in its course, its rays would be intensified and centralized by passage through the lens and concentrated on the matches. Ultimately, the heat would be sufficient to ignite the matches and surrounding tinder. This novel method of starting a forest fire enabled the instigator to establish a complete alibi by being many miles from the scene of fire outbreak when the blaze began. This set-up was so arranged that the fire would not be started until perhaps 24 hours after the snare was laid.

Human foot prints in numerous cases have led to the identification of malicious-minded incendiaries who willfully tried to destroy valuable government woodlands. A worn heel, a stubtoed shoe, and foot deformity as indicated in the tracks, special styles of rubber heels or hobnails, impressions of bare feet in the dust or mud, and unusual types of footwear have on one occasion or another enabled the forest detectives to run down cases of forest incendiarism. Similarly, unusual foot tracks of horses, mules or burros ridden by fire-starters have often aided in the trailing and detection of miscreants.



HUMAN FOOT PRINTS AS EVIDENCE

The naked eye will find nothing here but the microscope of a clever tracker found faint impressions of foot prints which led to the detection and conviction of a man who had set a Western forest on fire.

Where a foot mark of either a human being or a riding animal is discernible in the dust or mud close to the scene of a forest fire, the federal forest policemen make an impression of this evidence by flowing a wet mixture of cement or plaster over the track and allowing it to harden. Plaster of paris sets in about 5 minutes. The impression can be removed and used as court evidence thereafter if the culprit is caught and brought to trial. In case the track appears in dry sand or dust, a small amount of the plaster is sifted over it and then a few drops of water are sprinkled over the plaster. Where the footprint is found on a dusty floor or similar location, it is sprayed with a mixture of one part shellac and four parts of wood alcohol. This spraying takes 15 minutes or longer and often more than one quart of shellac is used on a single track. After the material has dried 30 minutes, a plaster impression of it can be made.

The age of a track is shown by the sharpness of im-

pression, by moisture and color, whether leaves or dirt lumps have fallen into it and by the condition of broken twigs. A trail made at night is often indicated by the way it bumps into or makes detours around obstacles. Whether a horse was ridden or led may be shown by



THIS CONVICTED AN INCENDIARY

The forest detectives trail many criminals and negligent sportsmen, tourists and campers to their homes by means of automobile tire tracks. They have become so expert that they can tell the direction the car is going, the approximate speed and the type of car by examining these tracks.

whether or not the trail passes under or around low-hanging limbs. Speed may be indicated by the degree of slide at the heel of the foot print, depth of the heel edge and toe edge, length of the drag at the toe and the distance between the tracks. If the man is carrying a burden, his feet are wider apart, his steps are shorter and more unsteady. In case of a lame leg, injured knee, or hip twist, the step is shorter.

Where the trail leads through dry pine needles, the trailers often have to get down on their hands and knees in order to distinguish breakages and minute differences in color which are not apparent from an erect position. Tracks in dry grass also are very hard to follow. Usually unless the wind is blowing, grass will hold all impressions made over it until the appearance of night dew, fog or rain. Through brush a trail can be followed by broken or skinned twigs. When a trail is lost, circles ahead in the probable direction of the passage often will favor its re-location.

The art of forest sleuthing has been developed to a stage of perfection and accuracy where the government representatives can now predict the travel direction of au-

tomobiles by merely examining the tire tracks. On earth roads, the pattern imprint of non-skid tires is steeper and more distinct on the rear side of each indentation while stones are shoved ahead by the wheels, the paths



SHOES WORN HEEL FOREMOST

It took a microscope to detect the clever effort of an incendiary to throw detectives off his track by wearing shoes heel foremost but the trackers were not fooled. Depressions in the tracks excited their curiosity and they quickly solved the mystery and got their man.

of these stones usually being intact close behind where they stop while dust is piled up by their shove on the forward sides. The imprint of partly imbedded stones, slightly displaced by the wheels also furnish evidence of machine direction, the displacement being backward in very small stones, and forward in those large enough to receive both lateral and downward pressure. A sprinkling of sand or dust usually is deposited on the rear side of stones or other obstructions passed over by the wheels while the forward side is usually swept clean. In dropping into chuck holes, the impact, or wider tire imprint, is greater on the forward side of the hole or against the obstruction. In dropping into ruts, a wheel will run on the high side to a feather edge, while in climbing out, it will remain in the rut until side pressure forces it to climb out abruptly. Other landmarks of automobile direction are: the direction in which water drops or mud are carried out of a mud hole, traction slips which occur in going up steep grades, the turn on curves which usually is more abrupt on leaving than on entering the curve and the "Y" where a machine backs out of a roadside stop.

Excessive speed generally is evidenced by the wind swirl disturbances of the track, the distance of the side throw of mud, sand or water, side lurch on rough roads and the distance of the wheel jump in passing over obstructions. The size of the car is indicated approximately by

the width of the tire tread although this is affected by the amount of load and the air pressure of the tires. When the load is heavy, there is a higher piling up of the dust ridge which is left in the center of the wheel track by suction and thrust of traction on pneumatic tires.

Under conditions where it is not feasible to dig out the footprint itself or to make a cast of it, the usual plan pursued is to photograph the track. In such case, the camera lens is placed exactly parallel to the surface to be photographed, to avoid distortion of perspective. A special clamp is used for attaching the camera to a board or support set up at the required angle. Thereafter, the photograph can be enlarged to the exact size of the origi-



HOB-NAIL TRACKS

Impressions from a peculiar kind of hob-nail in a shoe led the tracker to discover a shoemaker who remembered putting them in a man's shoes. The man was arrested and found guilty of firing a forest.

nal foot print. In cases where a camera is not available, the watchmen of the forest draw accurate diagrams of the tracks on paper and henceforward use them as identification indexes.

Finger print records are made permanent by sprinkling some powder of contrasting color such as aluminum or bronze over the prints. Dragon's blood powder for light surfaces and talcum powder or gray chalk for dark surfaces are very satisfactory. Where these materials are not available, powdered charcoal, or very fine pencil scrapings can be used over light surfaces and borax or flour for dark surfaces. All these materials must be dry when used as they pile up and are generally unsatisfactory for such purposes when damp. Subsequently, these finger prints which are smudged easily by friction, may be set by spraying lightly with a solution of one part of white shellac and four parts of wood alcohol. Dragon's blood can be set merely by heating slightly with a match flame after being applied to the surface where the finger print occurred.

SNELL FORESTRY BILL HEARINGS

IN appearing before the House Committee on Agriculture, at the hearings during the week of January 9 on the Snell bill providing for joint Federal and State action to check forest devastation and insure permanent timber supplies, Col. W. B. Greeley, Chief of the Forest Service, urged immediate action by Congress to insure a continuance of timber growth on lands best suited to this use.

"I am not appearing as a proponent of any particular bill," said Col. Greeley. "I am testifying in my capacity as head of the National Forest Service. My purpose is to urge upon the committee the need for Federal legislation of some comprehensive character to reforest the timberlands of the United States hitherto cut or now in progress of being cut; and to discuss the various forms which such legislation may take.

"Federal legislation is needed because the United States is now consuming wood four times as fast as it is being grown. Enormous areas of the virgin forests have been converted into lands largely or wholly unproductive. Two-thirds of the lumber users in the United States now pay more per thousand feet in lumber freight alone than they paid for the delivered commodity 30 years ago. The country faces definitely a growing scarcity and increasing cost of everything made from wood. The problem is nation-wide and must be dealt with in a nation-wide way.

"The definite aim of Federal legislation on this subject must be to make sure that all forest lands in the United States, whatever their ownership, are kept continuously productive; that as fast as one crop of timber is cut another is started. By this means and by this means only can the needs of the country be adequately met. There is no lack of forest land, if all not needed for agriculture can be kept at work producing wood. Federal legislation must aim at restoring forest land now idle to productive use and at preventing land now bearing merchantable timber or young growth from becoming idle through forest fires or destructive methods of logging.

"These results can in part be accomplished by extending the National Forests to include all Government-owned or Government-controlled lands chiefly valuable for growing timber or protecting watersheds, and through an enlarged purchase policy, particularly of denuded lands now privately owned and desirable for public ownership. State and municipal ownership should also be encouraged. But public agencies manifestly can not acquire even a major portion of all the forest land in the country. It is now 79 per cent in private ownership, and will largely remain so.

"Federal legislation should encourage tree planting by co-operation with States in growing and distributing planting stock; it should not only encourage but assist in effective nation-wide protection of all forest lands from fire; and it should also set up some method of reasonable public control over the cutting of private timber,

to the extent necessary to insure prompt reforestation of the lands cut over.

"Such a program involves putting private forest lands in the class with public utilities. We must recognize a dominant public interest in the way in which this form of private property is used.

"It must, however, be recognized with equal force that timber can not be grown unless the undertaking is a practicable and reasonable one for the owner. Growing timber is an economic matter. Reasonable and equitable aid must be given the private owner in accomplishing the public benefits desired, and such conditions of security must be created as will make it economically feasible for him to comply with public requirements.

"Various State laws have already applied the principle of public control—Oregon, Minnesota, New Hampshire, and Louisiana, for example. But we are very far from a uniform or consistent application of this principle. To bring that about, by one means or another, must be one of the important features of Federal legislation.

"Two methods for exercising public control to insure the continuous productivity of forest lands have been advocated in measures now before Congress. Sections 1 and 2 of the Snell bill would authorize the Department of Agriculture to define and establish what is necessary in each region, and through financial co-operation to encourage the enactment and enforcement of such necessary measures by the several States, through the police power. The Capper bill would accomplish the same purpose by direct Federal authority through the taxing power of the national Government."

After pointing out that each of these alternative propositions has its strengths and its weaknesses, Col. Greeley continued:

"These two principles are supplementary rather than opposing. I favor some immediate enactment in line with the principle expressed in the first two sections of the Snell bill, and I do not believe the country is now ready for the other step. But immediate action is urgent. Among advocates of a National Forest policy there is disagreement only on the one point as to whether the States or the Federal Government should exercise control over the cutting of timberlands. It may not be desirable or opportune to attempt a complete National forestry policy in one piece of legislation.

"It would be unfortunate in the extreme to permit substantial progress in Federal legislation on forestry to be delayed or impaired by a conflict of views on one feature only of the whole program. I wish to suggest that the committee consider the wisdom of drafting a bill covering the following points:

"(1) Broader authority and authorization of adequate appropriations for Federal co-operation with the States in fire protection. In my judgment this outweighs all other measures in immediate importance.

"(2) Authority for effective co-operation with States in growing and distributing young forest trees for planting.

"(3) Broader provision for extending National Forests through purchases of private lands.

"(4) Provisions for classifying all lands remaining in public ownership or control and for incorporating in National Forests areas found to be valuable chiefly for the growing of timber or the protection of water sources. This should apply to the remaining public domain and to lands in Indian reservations, with provision for equitable liquidation of Indian property rights in such lands. By this means alone 8,000,000 acres of forest land can ultimately be placed within National Forests and its permanent productivity assured." The Committee on Agriculture gave five days to the hearings and heard a number of witnesses, those favoring the bill being introduced by Congressman Snell. Among them were George S. Long, of the National Lum-

ber Manufacturers' Association; Alfred Gaskill, State forester, of New Jersey; Ray A. Danaher, president of the Sugar Pine Association of California; J. W. Toumey, Dean of the Yale Forestry School; H. C. Campbell, edi-

tor of the Milwaukee Journal; W. A. Babbitt, of the Association of Wood Using Industries; E. A. Sherman, Associate United States Forester; W. L. Hall, secretary of the Central States Forestry League; Philip W. Ayres, forester for the Society for the Protection of New Hampshire Forests; Elbert H. Baker, of the Cleveland Plain Dealer; Geo. Sisson, of the American Paper and Pulp Association; E. T. Allen, of the Western Forestry and Conservation Association; R. S. Kellogg, chairman of the National Forest Policy Committee, and Charles Lathrop Pack,

**WHAT'S THE IDEA? SHE WAS ALWAYS HAPPY
DOWN ON THE FARM, WASN'T SHE?**



Darling—in the Portland (Maine) Press-Herald.

president of the American Forestry Association. Gifford Pinchot appeared with others in opposition to the bill.

The committee is expected to make a report on the bill within the next few weeks.

**THE COUNTRY HAS GONE DRY—BE CAREFUL WITH FIRE
FORESTS FURNISH FUTURE HOMES—DON'T BURN THEM**

THE PENNSYLVANIA FORESTRY ASSOCIATION REPORTS

By F. L. Bitler

FORESTRY in Pennsylvania has made good progress in the year 1921. There have been added 17,136 acres to the 1,102,695 acres in the 23 State Forests, making a grand total of 1,125,611 acres, which were purchased at a cost of \$2,545,135. The total amount which has been expended for administration, development and improvement was \$4,702,156, making a total expenditure for land and care of \$7,247,291. The State Forests are now conservatively valued at \$12,000,000, showing a net gain of \$4,752,709. Extensive plans had been formulated by the Department of Forestry for the acquisition of more land, but the Governor was compelled to veto the appropriation of \$500,000 for this purpose, owing to lack of State funds.

The forest lands of the State have been divided into 26 forest districts, each in charge of a district forester, each district containing from 350,000 to 500,000 acres. In three of these districts no land is owned by the State.

There are 380 State-owned buildings on the State Forests, valued at \$294,038.

There are 43 forests and 87 forest rangers in the employ of the Department of Forestry, while 2,488 Forest Fire Wardens who watch for and fight fires are intermittently employed.

Much work has been done in improving the State forests since their purchase. Approximately 2,000 miles of boundaries have been surveyed, cleared and marked, and 4,000 miles of roads, trails and fire lanes constructed and maintained.

Scattered through the State are some tracts of forest land of unusual interest and scenic beauty. Twelve of these have been set aside by the State Forest Commission as State Monuments. A number of State Parks have been created for their educational, recreational and esthetic value.

The outstanding feature of forestry in Pennsylvania was the appropriation of \$1,000,000 for forest protection against fire for two years.

The Pocono Forestry Association maintains a splendid fire-fighting organization, and has five wooden towers equipped with telephone lines. Its members also plant annually thousands of young trees in the Pocono Mountains.

The Anthracite Forest Protective Association in the hard coal region has four steel and one wooden towers, with telephone lines, and a good fire-fighting force.

The Blair County Game, Fish and Forestry Association not only aids in suppressing forest fires, but also is active in planting trees and in protecting and propagating game and fish.

The Central Pennsylvania Forest Protective Association and the McKean County Protective Association have rendered valuable aid in their respective localities. The Lycoming County Protective Association has assisted in the protection of forests in that county by reason of contributing to patrol service, and educational work.

The Boy Scouts of America, the various railroad and water supply companies have been helpful in reducing forest fire losses.

The State Forest Nurseries, since their inception, have supplied 48,853,936 trees, of which 34,216,727 were planted on the State Forests, the plantations now covering 22,410 acres.

About 4,000,000 seedlings and transplants will be available for free distribution during the Spring of 1922, and there will remain 8,000,000 too small for present use, but which will be distributed in the Spring of 1923.

The Department of Forestry is co-operating with private timberland owners throughout the State by making examinations and recommendations as to the practice of forestry on their holdings.

The State Forest Academy, at Mount Alto, has continued to supply its yearly quota of men splendidly qualified to care for the future forest of our State.

The Department of Forestry in Pennsylvania State College has a steadily growing student body.

Lehigh University is constantly improving its Arboretum and experimental plantations, which will give much useful information as to the value of different species of trees, their comparative growth, etc.

The new Allegheny National Forest will comprise 412,000 acres in Warren, McKean, Forest and Elk Counties, and a tentative allotment of \$150,000 for the purchase of lands has been made by the Government. The headquarters of this forest will be at Warren.

The State of Pennsylvania, formerly the largest producer of timber in the United States, uses annually about two and a half billion feet of lumber, of which it now produces but one-fifth. The annual loss to the State, due to the falling off in its lumber production, amounts to \$100,000,000—twice as much as it costs to run the State government. We pay at least \$50,000,000 a year for lumber imported, which should be grown at home, and more than \$25,000,000 a year freight on this lumber. The loss through closing of wood industries, floods, which could be prevented, etc., represents at least \$25,000,000 more.

The United States Chamber of Commerce has appointed a Forestry Committee which is making an exhaustive study of forest conditions in this country, visiting and holding conferences in different sections. The report is awaited with interest. Our President, Dr. Henry S. Drinker, is a member of this Committee and is Chairman of the Subcommittee on Timberland Taxation.

The fiscal year of the Pennsylvania Forestry Association ended December 1, 1921 with a very creditable showing.

Officers elected at the annual meeting for 1922 were: Dr. J. T. Rothrock, President Emeritus; Dr. Henry S. Drinker, President; Mr. Robert S. Conklin, Mr. J. Freeman Hendricks, Mr. Albert Lewis and Mr. Samuel L. Smedley, Vice Presidents; Mr. Samuel Marshall, General Secretary and Mr. F. L. Bitler, Recording Secretary and Treasurer.

TREES IN WINTER

By Henry Thew Stephenson

SOME people who are fond of flowers and delight in the association of trees relate their pleasure wholly with summer. It is true that few flowers bloom in the winter. But it is a mistake to think for that reason the winter woods are silent. In spite of the many flowers growing beneath the foliage of the forest one hardly feels unsafe in saying that in the wood the tree's the

It is also the most difficult to acquire. One characteristic feature is the method of branching, a quality plainly visible in winter, but so masked by foliage in summer as to be impossible of observation. If one could imagine an ash and a maple, one the exact counterpart of the other in outline and general branch distribution, the two trees would still look so different that the accidental similarity might pass unnoticed. For there is a clumsy coarseness about the twigs of the ash in sharp contrast to the graceful delicacy of the slender twigs of the maple. But the twig of neither tree can be seen against the sky in summer. How often does one lament the disappear-



BITTERNUT

It is easier to identify many trees in winter than in summer, when unmistakable characteristics are camouflaged by the thick foliage.

thing. And by all odds the winter is the best time to get acquainted with the trees.

Many attempt to identify the trees only by the leaves. An experienced woodman considers the leaf as the least important mark of identification. And as to flowers—the flowers of many of our largest trees are so inconspicuous that many people have never even noticed them, perhaps would not have recognized them as flowers if pointed out.

Let me see if I can make a little plainer what I mean by saying that winter is the season to be preferred for the task of learning to recognize the trees.

One who knows trees thoroughly, as a rule, recognizes them by indications that cannot be accurately put into words. He recognizes a tree in its entirety as one recognizes a person. This is the surest kind of identification.



SYCAMORE

The graceful, reaching white arms of the Sycamore are seen at their best in winter when undisguised by foliage.

ance of a distant line of white sycamore tops as they are gradually blotted out by the growing foliage.

Bark is another significant characteristic best observed in winter. The form, texture and color of bark is a very illuminating subject of contemplation. And it is not so easily studied when poorly lighted beneath a mass of foliage which may also materially influence the tone of the color. And the tone gradation of bark is a matter



CHESTNUT TWIG

The ultimate grace of the chestnut tree is clearly expressed even in its smallest twigs.

of great delicacy. But these are qualities that an inexperienced student may well despair of as a matter of special study at first—winter or summer. It is the kind of tree knowledge obtained last. One does not learn to identify trees by reading written descriptions of bark. Rather, he develops a feeling for bark as a result of his study and association with trees in the field. What, then, is there for the inexperienced student to occupy himself with in winter?

Whoever has studied botany is used to a key based upon the form and structure of the flower. When one comes upon a strange plant at a season other than the flowering the key is useless. As a matter of fact there can be no key based upon but

one element of plant life that will serve to identify all plants at any time. The structure of the flower serves in the greatest number of cases and is therefore the one universally adopted. It is not true, however, that the usual system of identifying trees based upon the leaf is the most useful. In fact, a key based upon the winter appearance is easier to apply and more certain of application than the summer key based upon leaves.

Though the finer distinctions of bark and branches cannot be put into words there are many distinctions so divergent as to be of great prac-



BLUE, OR WATER BEECH

Readily and safely to be identified by a characteristic bark.

tical advantage. One may not recognize the subtle difference between the bark of a white elm and that of a slippery elm, but neither could be confused with the bark of a beech or a birch. Many of the rough barked trees are divided into ridges and furrows that present easy characteristic differences. The flat-topped ridges of one will distinguish it from the round-topped ridges of another. In some trees the ridges are divided by transverse cracks into longish blocks as in the sassafras, or into squares as in the dogwood, or into hexagonal blocks as

in the tupelo. Other kinds of bark flake and scale without forming deep fissures as the sycamore. Sometimes the ridges of the sugar maple rise in great projecting flaps. Sometimes the ridges scale off in different ways. The scales of the shagbark hickory are attached at the top and break loose at the bottom; those of the silver maple are attached in the middle and break loose at both ends.

But it is upon the twig that one depends most for the identification of species. Twig is a technical term that implies not only the end of the branch, but also that portion only which grew the preceding season. This twig is made up of skin, wood and pith, as in the main stem of the tree.

When one breaks a twig of sassafras he recognizes the characteristic odor. Had it smelled of wintergreen he would have suspected a birch. Some twigs when broken will show a dry pith, others will exude a milky



BUTTERNUT

The bark is light brown-gray, very rough and seamed with short, flat-topped ridges.

sap as in the mulberries. If the twig is cut off sharply at right angles the generally star-shaped section of the pith suggests an oak. As the round sectioned pith is so common it is not of much use as a mark of identification. But if a twig is cut longitudinally through the center of the pith a new set of characteristics is displayed. The pith may be solid or continuous as in the great majority of trees. But it may be chambered, that is, consist of transverse divisions or diaphragms separated by empty spaces. There are but three large forest trees common in the central states that have chambered pith. It is frequently disguised and hard to recognize in the hackberry, but it is very plain and evident in the walnut and butternut. The color and the spacing of the diaphragms instantly distinguish a walnut from a butter-

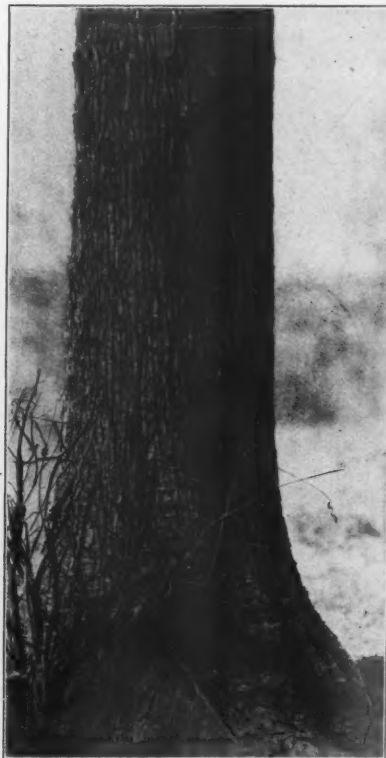
nut. In many respects the twig of butternut (a walnut) resembles the twig of bitternut (a hickory.) A glance at a section of the pith immediately differentiates them. The butternut pith is brown and chambered, the bitternut pith is brown and not chambered.

Though I have spoken of the pith first it is the least important element in the winter identification of trees by means of the twig. It is on the



FLOWERING DOGWOOD

The dogwood, its bark characteristically divided into squares, is readily recognized by the visitor to the winter woods.



HOP HORNBEAM

The bark is gray-brown, scaly and scored perpendicularly into long, flat narrow strips about four inches long.

epidermis, or outside skin, that we mostly depend.

Twigs are rough or smooth. They may be of almost any color, varying from the bright green of the sassafras, the brilliant yellow of the golden willow, through various reds, browns, grays and black. Twigs are sometimes smooth, or hairy, or ridged, or winged. The square section of the blue ash twig immediately distinguishes it from the other ashes. While the flattening of the twig at the node prevents us from confusing an ash with

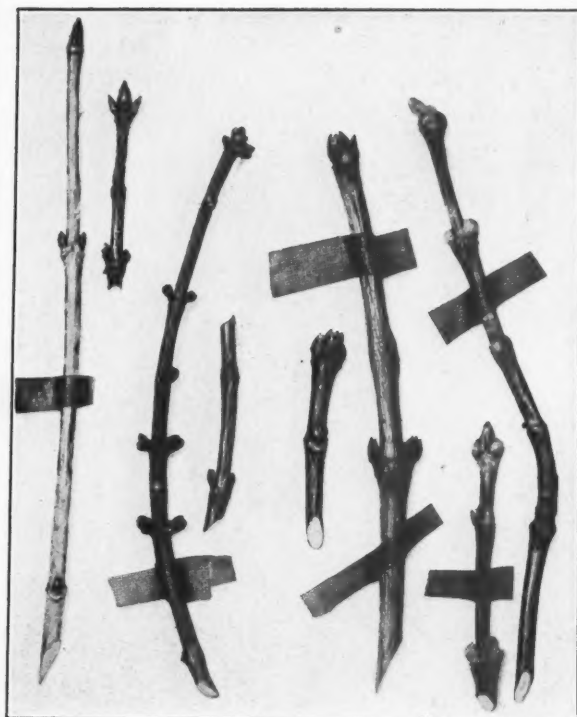


BUR OAK

Known also as Mossy Cup Oak. It has an ashen gray, or gray-brown, thin, scaly bark. It is one of the tallest oaks in the eastern United States.

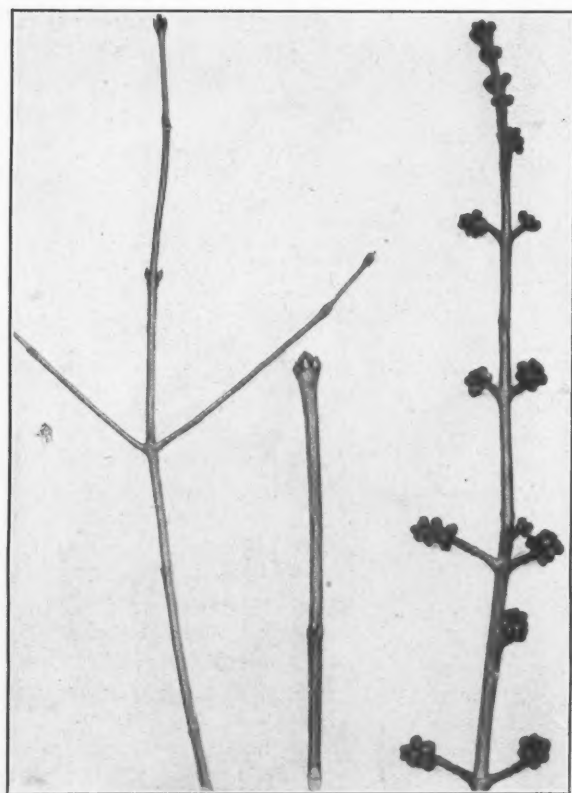
any other tree. We have, however, hardly made a beginning in the enumeration of the differentiating characteristics of the twig. Every leaf which fell in the autumn left a scar on the twig. If the leaf scars of a large tree are opposite we may be reasonably sure that the tree is a buckeye, an ash, or a maple. And there are but a few low, or shrub-like trees that present this characteristic. If the scars are not opposite their arrangement may still be very helpful. The leaves may originally have been attached to the stem in such a way that the twig has remained straight, or attached in another way which produced a twig elongating in a zig-zag fashion.

Furthermore, the outline of the scar is characteristic. In the maples it is, generally speaking, crescent shaped, in the catalpa oval, in the walnut heart-shaped, etc. But there are finer



MAPLE TWIGS

Sugar, Silver, Norway and Box Elder. The graceful delicacy of the slender twigs of the maple is marked.

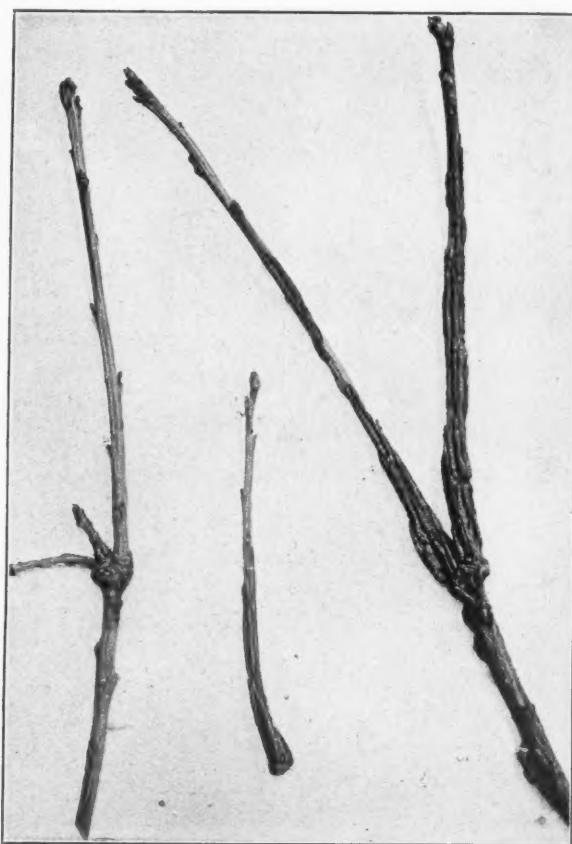


SUGAR, NORWAY AND SILVER MAPLE TWIGS

This shows the great diversity of the buds in the same genus.

distinctions of shape than this. The scars of the white and red ash are similar except that the top line of the white ash scar has a notch in the middle of it and the red ash has no notch. The same difference occurs in the scars of the walnut and the butternut. Sometimes the leaf scars extend fully round the tree. They just meet in the Norway maple, but there is a little spur formed at the point of meeting in the box elder (the ash-leaved maple.)

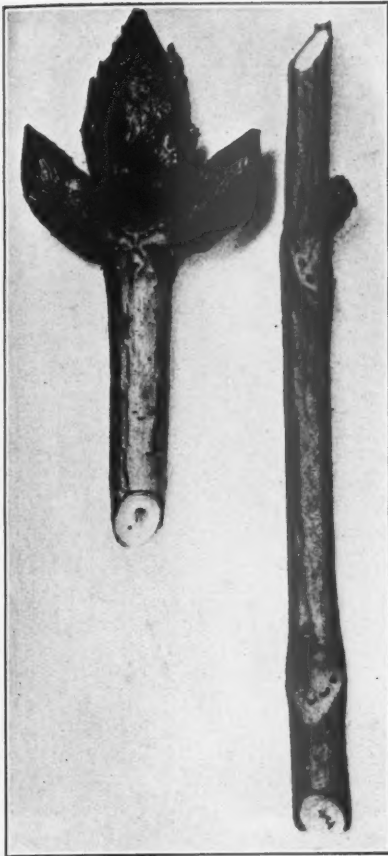
Every rib and vein in a summer leaf is in reality the end of a sort of tube or channel which runs back through the petiole of the leaf, down the stem, and communicates



BUR OAK TWIGS, SHOWING CORKY RIDGES

The younger branchlets are often conspicuously corky-ridged, but this is not an altogether dependable characteristic.

with the root system. When the leaf fell in the autumn each of these elements of the circulative system of the tree left its individual mark. These bundle scars, as they are called, vary greatly in number, shape, position and distribution, but are uniform for a given species. There may be one, three, seven, etc., arranged in a straight or curved line, or variously grouped. Unless one uses a hand glass for inspection the leaf scars of the elm and of the mulberry look very much alike. One is oval, the other, perhaps, a trifle more flattened. Both have several bundle scars on a depressed center of the leaf scar. But a closer examination with the glass reveals the fact that the bundle scars of the white elm are still further



HORSE CHESTNUT

The striking looking buds are one of the best means of identification.

depressed, those of the red mulberry raised like little pimples.

There still remains the bud which yields an equal if not superior amount of information. Some twigs have terminal buds, some twigs do not. Some buds are pressed close up against the twig as in the willows, others project outward at various angles. They vary in shape from almost needle-like as in the beech to nearly spherical as in the silver maple. The buds of certain willows are barely 1-16 inch long, those of some of the magnolias fully two inches in length. Every bud is covered with scales. Their size, shape, color, texture and arrangement are all important details which help to identify the species. For instance, the bud of the tulip tree is shaped like your thumb and covered with a pair of dark brown scales. That of the sycamore is also brown, but covered with one scale that

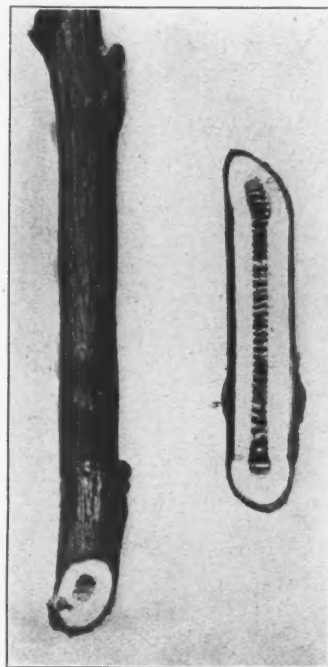
is sharply conical. Willows are also conical and covered with one scale, but the buds are small and pressed close to the stem, that of the sycamore large and divergent. The buds of the horse chestnut and the buckeye, two species of the same genus, may be distinguished by the fact that one is covered with sticky gum and the other is not.

The little breathing pores in the epidermis give rise to the spots known as lenticles. These are often inconspicuous by reason of their small size. At other times their conspicuous size,

ence throughout the winter affords not only an assistance in identification but also material for study. Everyone is familiar with the sycamore balls that dangle aloft all winter. The birches frequently retain a portion of their fruit. The persistence of the keys of the box elder not only differentiate it among maples but also enables one to distinguish a male from a female tree.

I have by no means exhausted the marks of identification contained in the twig of a tree. But I have called attention to enough to justify my first statement: The winter is the best time to begin the study of trees. If one uses a key based upon these characteristics he can identify trees with a greater degree of certainty than he can in summer using a key based upon leaf characteristics alone. It is true, there will be difficulties, but the difficulties are fewer.

There is another distinct advantage in winter study. Probably no one who has read thus far has mentally called for a definition of winter. Yet I have not used the word in quite its ordinary sense. One need not picture to himself the arduous exercise of trudging through the snow in zero weather. In the tree world winter begins with the



WALNUT

The chambered pith is shown at the right.

color, texture and position constitute important marks of identification. The characteristic horizontal marks of the bark of the cherry are produced by the gradual elongation of the lenticles of the twig.

Prickles and spines grow from the epidermis. Thorns spring from the woody substance within. The presence of these, their size, shape and color determine a number of species. It is also important to notice whether they are spines or thorns.

Though the fruit of many trees falls to the ground in autumn, or is promptly eaten by the birds, its pres-



AILANTHUS

Showing a scar and lenticles or little breathing pores.



BUCKEYE
Easily distinguished
from the horse-
chestnut bud.



**HORSE
CHESTNUT**
Showing a distinc-
tive scar.

However, in winter we are alone with the trees and shrubs. One comes closer to them, gets better acquainted with them. I suppose it is a mere fancy on my part. But I know an ash, a walnut, and a maple so close together that their branches overlap a trifle. I have known them for a long time. Each is like a good friend. I think I know every limb any of those trees has lost in a dozen years. But, somehow, in summer their individuality seems impaired. I think of them more as a composite group, each concealing the good points of the others. And I cannot get so near them. A mere fancy, of course, but I welcome always the autumn wind which strips the concealing foliage and restores the individuality of my old-time friends.

I have spoken mainly of deciduous trees. But they do not involve the whole story. It is true the evergreens do not show so great a difference in their winter state. But



BOX ELDER

Showing spur and
terminal bud.

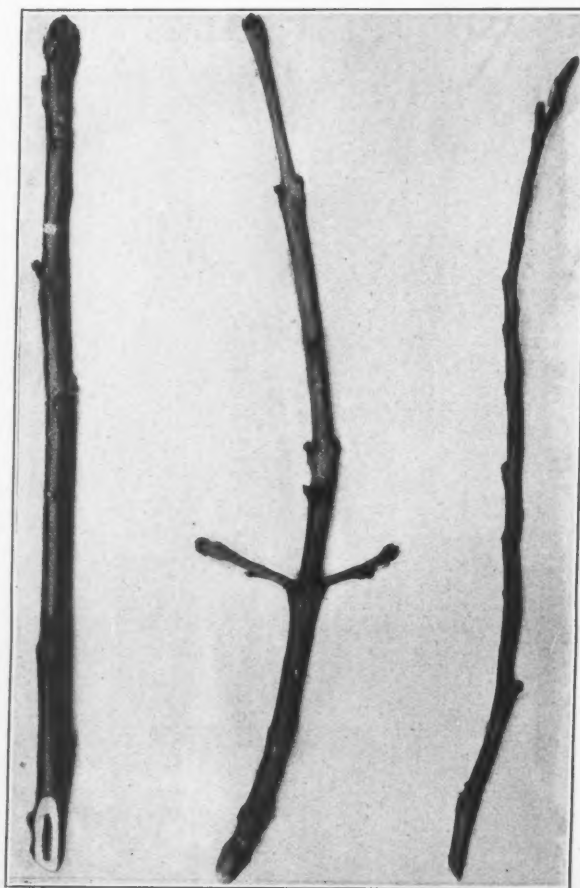


CATALPA

The twig is the best
key to identification.

fall of the leaf in autumn and continues till the opening of the buds in spring. To all intents and purposes the twigs and buds remain quiescent throughout this long season. In other words, nearly half the year is winter to the trees. Compare this long season during which the conditions of study do not change with the short flowering period of the willows, or even the part of the summer that remains after the leaves are full grown.

There is, too, the distinct advantage to one who is fond of the woods and fields of opening a great opportunity for study and enjoyment during a season of the year so generally considered closed. Yet I would not urge the exclusive study of trees in winter. One may learn considerably more than half the story, but he will not learn it all.



WALNUT

WHITE ASH

TULIP

Illustrating the diverse appearance of the twigs of some of our most familiar trees in winter.

there is something else. Only the untrained eye is wearied by the monotony of the winter landscape, or is irritated by the absence of color. The color is there; not in so great a variety, not presenting such striking brilliancy, but, rather, soft and comforting. And how much of it is due to "the withering pines and the hemlocks."

In summer the evergreens do not put on their new coats so quickly as the other trees. In the outburst of deciduous foliage in the spring the evergreens seem somewhat to succumb to the youthful ardor of their many - tinted rivals. But later the tables are completely turned. The majestic conifers, with so much more ancient lineage, can afford to bide their time for Autumn, the season of their glory, approaches.

THE ROYAL PALM

(OREODOXA REGEA)

By Hollister Sage.

THE United States is not recognized as a hot country. Nevertheless, lower Florida is truly tropical. Although the peninsula does not extend into the torrid zone, it is nearer the equator than sunny Italy, Greece, the blue Mediterranean or even northern Egypt. Four hundred miles long, Florida's position is an enviable one, for the Gulf Stream flows on both sides of the state. That miracle-working river of warm water in the Atlantic, mystically takes its way with force unabated to

frozen Labrador and across the northern ocean, melting icebergs, making a safe path for the great liners and blessing two continents; but its influence upon Florida is super-natural.

If you have never viewed tropical plant life, the products of Nature unassisted, her vigorous and graceful spontaniety where freezing never interferes, let the wings of your imagination carry you to Miami, our most southern city. It has been given a musical Indian name.



Four Beautiful Royal Palms in Royal Poinciana Park. The Fifth, in the Foreground, is a Coccoanut Palm.



Here, midst Nature's most distinguished offspring, no single growth so deeply impresses the beholder, none so fixes itself upon his attention, none remains stamped upon his memory as does the Royal palm. Possibly you have never seen one of these princely trees, even under glass.

You alight from train or steamer and decide to see the sights. When first coming among these regal palms you notice a series of brownish-white pillars. You do not see their tops, as you are not star gazing. Involuntarily you direct your vision twenty feet higher, that you may see the tops of these singular columns and, failing, look up and up, in open-eyed wonderment. In ecstasy you behold a splendor of sea-green fronds outlined against fleecy clouds, or the ether. The impulse is to clasp the hands and to gaze, spellbound, in the attitude of devotion. You wish the car would stop and that all chatter cease, giving you an opportunity to comprehend the vision and regain your poise. Can these symmetrical, chiseled shafts be the boles of living trees? The wild witchery of the banyans attracts you, the lawless disorder of the coconut palms elicits your approval, your joyous acclaim, but the proud, calm majesty of this king of palms fills you with awe and reverence. You begin to speculate as to what may be



Above--One of the lovely spots in Royal Poinciana Park at Miami, where the Royal Palm --the Wonder Tree--is found in profusion.

Below--The South Florida Highway which has been greatly improved and beautified by the planting of young palm trees.

the office of this tree. Does it bear nuts or other food delicacies, or produce rubber, or fuel or turpentine, or logs for the sawmill?

The wonder tree offers to man no material gifts. Its mission is a distinct one, much greater than the production of foods and fruits. It is the ministry of things divinely beautiful, to console and lift up the soul of man, to heal his nerves and to impart a heavenly balm where the wear and worry of time and sense have lacerated and begun to destroy him. The balm of the Royal palm is invisible. But it steals into the soul, bringing peace and driving away care and fear.

Because of its grace and beauty, the tree is a universal favorite, coveted by everybody, but until recently its propagation has been shrouded in darkness. Ninety per cent of its seeds refused to sprout, and of those which germinated, ninety per cent died while mere seedlings. Buyers pay \$5, some \$25, and occasionally several hundred dollars apiece for choice trees, for they may be moved readily when very large. Where a wild baby Royal is found it will bear watching to learn how very soon it perishes. Perhaps one tree matures from a thousand seedlings. Men have wondered about these conditions for generations. But at last the secret of germination and growth has been discovered by a Miamian, Mr. W. A. Williams, owner of Royal Poinciana



Above--A bit of natural Southern Florida land, graced by the imperial beauty of three Royal Palms.

Below--Along the Miami River, adjoining Royal Poinciana Park, The Royal Palms are reflected in the serene and quiet water.

Park. After years of experimental work he has learned that the seed bed and nursery conditions must be exact, while enough moisture and not too much must be given to satisfy the imperial baby. The nursery is covered with slatwork and prepared layers of soil delight the young plants. Mr. Williams now has under cultivation something like fifty thousand, and hopes to be able to present the state with a sufficient number to set a double row beside the new Tamiami trail which crosses the peninsula to the Gulf Coast, a distance of ninety miles.

What men have long desired to know he modestly relates: "About ninety-five per cent of the seedlings perish; mostly soon after germination, although many reach a height of several inches. The single spear that first appears will wither before a hot wind or intense sunshine. At six or seven inches they seem disposed to break off at the surface. Benches entirely under control are the safest in which to rear the seedlings. Gravel must be the first layer, to provide drainage. Next two inches of clay or heavy loam to retain moisture. The entire surface of this is covered with the seeds to the depth of one-half inch. The seeds must then be covered with four inches of mulch or rich, light soil. Then we have to await the appearance of the slender spears patiently for ninety days, keeping the beds right with water at all times. If sufficient moisture is not provided the seeds do not germinate; if too much, they sprout and die.

"After the plants begin to show they must be sprayed often to keep down red spider and other pests and make the plants vigorous. After six to eight months growth in the original beds, the youngsters must be transplanted into pots and following this from time to time into larger receptacles, until they are eighteen to twenty-four months old. Then they may be set in the ground. The average man fails because he leaves the plants to care for themselves, which they cannot do. Many apply fertilizers, which burn them. Palms require fertile soil and will take some enrichment, but not until after they are fifteen to eighteen months old."

The habitat of the Royal palm is along streams and in moist places. It is found rarely at a distance from water. This palm reaches perfection in the wilds in Royal Palm Park, one of the unique possessions of the state. It is a primitive wonderland, comprising nearly two thousand acres, about forty miles southwest of Miami. Its situation is in the Everglades, that remarkable three million acre prairie which Nature has been working out during the past thousands of years. The park's proudest feature is Royal Palm hammock, on Paradise Key, a large "island" conspicuous in the landscape. Here in natural beauty grow hundreds of Royal palms to a great height, some exceeding one hundred feet. They overtop other trees and lift their star clusters to view proudly against the sky, while beneath them thrive many varieties of rare orchids and ferns. Botanists early discovered the wealth of rare flora on this hammock.

The efflorescence of the Royal palm is most remark-

able. In the vernal season a circle of bristling spikes or remarkable buds one foot or more in length appears upon the smooth trunk of the tree, almost within reach of a tall man. The owner, if new and unaccustomed to the tree, may fear at first that this excrescence is a "sport," inconsistent with the general harmony of his favorite and be disposed to remove it, until some day, possibly directly following the sharp and sudden down-pour of a tropical shower, he discovers the spikes have dissolved into an encircling fringe of graceful blossoms or seed pods. Unlike the towering maples and beeches of the North, these graceful trees do not require a century or more in which to make their growth and a like period to decline and disappear.

The world's largest paper machine is now being operated. It makes a stub of paper 12 feet, 2 inches wide, 327 miles long every 24 hours, using 110 cords of wood.

3,500 acres of pulpwood are required to furnish the paper for one day's issue of all the newspapers in the United States.



Wide World Photo.

THE NEW ELECTRIC DRILL AT WORK

One of the most important inventions of the century in connection with the care of trees—mechanical power in a new field. The important and tedious operations of the tree surgeon in digging out dead and diseased wood and boring holes for bolts with which to strengthen and support a tree are now, as a result of an invention of F. A. Bartlett, of Stamford, Connecticut, being done at a saving of anywhere from 50 to 200 per cent. of the time and effort formerly required. The power drill, one of the most important inventions in the art of tree surgery in more than a century, is run by electricity generated by the apparatus shown in the left foreground. This complete gasoline engine, generator and resistance coil outfit develops one-half horse power, weighs but slightly over 100 pounds and can be taken wherever there is a tree to save by modern surgical methods. The photograph shows the machine used as a drill and a bore.

FOREST RECREATION DEPARTMENT

Arthur H. Carhart, Editor

A FEDERATION OF OUTDOOR CLUBS

MANY outdoor organizations with closely allied interests have for many years been working for similar objectives. The announcement that there is to be a convention in St. Louis the last week in April at which it is hoped to form a centralized federation is a giant stride in the right direction.

According to informal information the convention is to be called by Governor Hyde, of Missouri. It is to have as a presiding officer no less a figure in outdoor activities than Mr. Albert Britt, editor of "Outing." Many friends of the big outdoors have expressed their interest in the convention and under the leadership of these two men much that is good will undoubtedly be accomplished.

The announcement indicates interesting things and possibilities. The greatest of these is the fact that the members of the universal outdoor fraternity have come to the conclusion that there is to be a central organization where will be common meeting ground. A review of the past will show how necessary this is.

Naturalists, geologists, foresters, landscape architects, park boards, outdoor societies, forestry associations and many other groups of people are all interested in some phase of the outdoors. As a result many societies have been formed which have as their aim the advancement

of a certain field of outdoor work. This list might be indefinitely lengthened to take in hundreds of professional groups and popular societies interested in some phase of nature. Besides these there is a large group of sportsmen in the country who are vitally interested in many fields.

Each society has limitations in its scope of work. This has been necessary to accomplish results. If each had tried to spread over all outdoors there would have been little accomplishment in the past and a great deal of confusion.

But the various organizations in limiting themselves to one particular field of outdoor activities have often lost sight of the fact that certain phases of their work are closely linked up with those of other societies. The inter-relationship between all things outdoors has been lost in these clubs of limited fields because the study of detail is more engrossing to the human mind than is the study of the whole. It is more easily understood and more fully developed knowledge of a limited activity may be grasped by the enthusiast, whether he be a trained scientist working in that field or an amateur.

A few illustrations will serve to point out this mutual



JUST YOU AND YOUR NEIGHBOR ON A PICNIC.

Even the casual picnicker is interested in all things outdoors. He is therefore interested in the formation of an organization to promote its welfare.



THE BOTANIST

Flowers are the soul of many outdoor places. Of prime interest to the botanists, flowers and plants are an appeal to all.

lack of contact. The illustrations are not isolated but typical.

Game protective societies are deeply concerned with the wild life. Birds and beasts of the country, their life habits, their foods, their natural and artificial enemies

and many other features relating strictly to game hold their interest. The study of these problems is so engaging in many cases that the relation of these problems to ones similar in other fields is lost sight of.

The forester has to do with life habits of trees, their natural enemies, their culture, increase, perpetuation and



MOUNTAINEERING

The mountaineer will have a better trip if he can recognize the flowers, trees, rocks, insects and other natural things along his trail to the peak tops.



THE MOTOR GIPSY.

How dependent the motor gipsy is on other fields of outdoor work! The very essence of his enjoyment lies in the protection of the forests, the protection of wild game and other natural beauties.

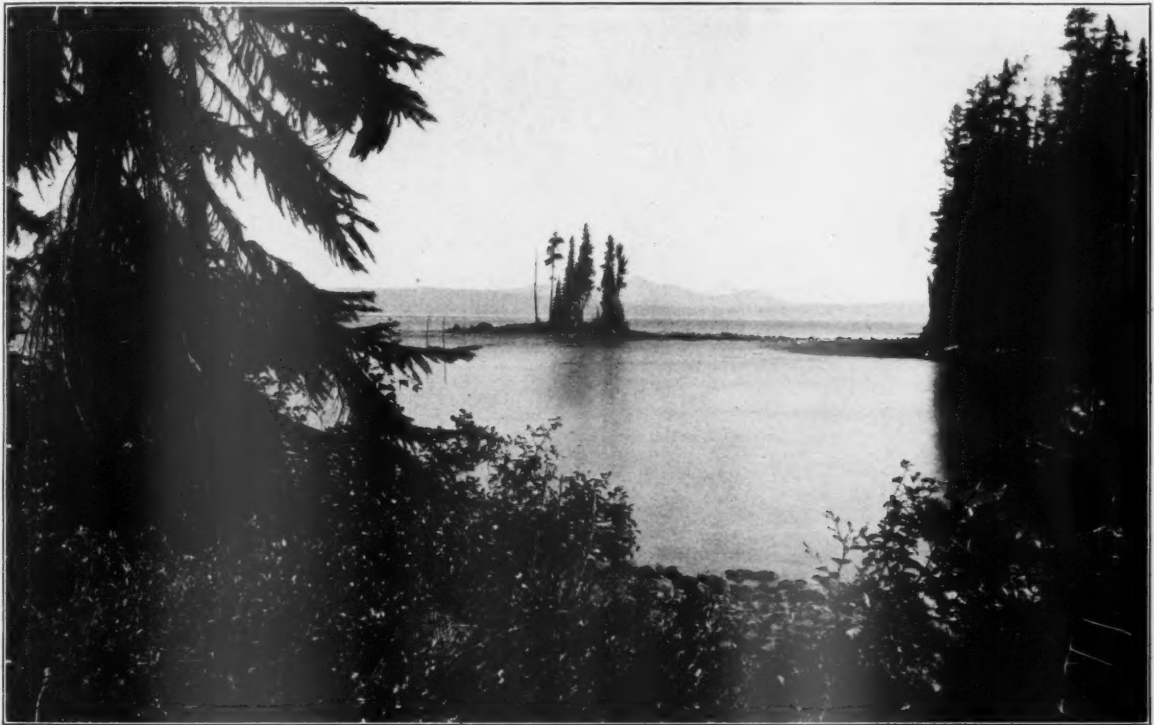
like problems. Those who deal with trees are essentially interested in trees. The field is of such scope that one man or even the whole group of men interested in it find enough to wholly engage their attention without going outside of its limits.

But here is a typical example of one field of work being very closely allied to the other. Wild game of all kinds is very materially dependent upon the forests. Without a good forest cover much of the game is lost. A barren, dry waste is not a place for game. A forest guarantees against such a waste and gameless tract.

In another particular the forester and the game enthusiast are vitally mutually interested. That is the fire problem of the forests. Fire kills forests. It kills game

The reverse is true. Undoubtedly the foresters, working in the presence of wild life, have information that would be of value to the men working on problems of game protection.

Looking at this particular example from the viewpoint of the game enthusiast we find that there is a decided lack of understanding on the part of sportsmen as to the work of the foresters bearing on game problems. Foresters are responsible as a profession for the greater protection given our forests. They have been instrumental in conserving them and turning the tide from irrational cutting and wastage to a well organized policy of rational use through true conservation. Immense quantities of game have been protected by and are dependent



NATURE LOVERS

Nature lovers surely have a lot for which to thank the workers in other fields. The forester, geologist, entomologist, botanist, and in fact, practically all specialized fields of outdoor work contribute directly to his knowledge and enjoyment.

at the same time. The enemy of game is also the enemy of trees. It is to the interest of both the foresters and the game protective organizations to fight forest fires.

In the past there has not been the meeting ground that should be common to these divisions of outdoor work. The foresters have known of game problems and have in many instances taken deep interest in and gone far towards solving them. But there has not been the contact that there should be on the part of the foresters with the work being done by the game protective clubs. It is wholly probable that much of the information that has been amassed by the game clubs would be invaluable to the forester in the studies of game conditions. If such an exchange of ideas would have been possible a great amount of past useless effort would have been prevented.

on these forests. It is probably true that the bulk of the big game of our nation is now within the borders of organized forest units.

If it were possible to bring home to the game protective clubs that they are vitally interested in the forests, their administration, protection and proper conservation there would be a direct move on their part towards the full accomplishment of such a constructive program. Because of their interest in trees? Not especially, but rather because the work in the forests has a direct relationship to the game problem. Trees mean more game. Forest work means more and better trees. Game protective societies are therefore interested in forest work.

Up to the present time there has been no meeting ground of these two great divisions of outdoor activities

so that one may learn how dependent it is on the other. There has been no place that will act as clearing house for the information secured by each working independently. If such a field for parley had been established a decade ago each activity would be further along now because of the understanding arising from conference and because of the opportunity to compare notes.

There is a lack of correlation and coordination among societies interested in game. Audubon society work is aiding and abetting work similar to that carried on by many local game and fish clubs. The Bison Society is in game protection in a very limited field. Their experience is none the less valuable for they have undoubtedly met and solved problems that are now confronting scores of other game protective agencies. There is some exchange of opinion among such societies, particularly among the heads of the organizations, but the mere member has little touch with what is going on in fields that parallels his interests.

Just in this single achievement, a field of common meeting, this proposed federation will accomplish immense benefit. It will be a place for exchange of ideas, will educate one group of workers in the work of the other groups and thus move efficiently to the accomplishment of all of the objectives of each field of endeavor.

The Federated Outdoor Clubs of America, properly organized and under proper direction, will be one of the greatest benefits that could come to lovers of the out-



GEOLOGISTS

This curious formation is the "Totem Rock" in the Colorado National Forest.



A GEOLOGIC STUDY

Such geological forces as are demonstrated in the forming of this curious freak rock are of interest to every one. In such peculiar ways the forces of nature are brought especially to our attention.

doors, our broad landscapes and their inhabitants—the trees, flowers, beasts, fish and birds. It would stand for true conservation of our wild life. There would be a modifying of extremes of over use or over protection. A true conservation program affecting all outdoors could be worked out and applied with this federation sponsoring it. It would mean that the peril of raiding of national natural resources for the benefit of a few at the expense of many would never lift its head without a strong champion of rational conservation picking up a cudgel against it. This would be because each group would come to know how dependent one outdoor factor is on the neighboring factor and the enemy of one would be recognized as the enemy of the other.

This federation will be in politics but not a political machine if it is to do its most good. Today an isolated group of the outdoor fraternity strives to advance one scheme for protection of some natural resource through legislation. It is an uncorrelated move to produce good for one division of outdoor activities. A small group is behind the movement and it is often lost because of non-support.

But often indeed that very legislation has a direct bearing on the work of another field of outdoor use. The only reason that other agencies, or in fact all outdoor clubs do not put their shoulder to the wheel with the group initiating the move is because first it is not clearly understood that the legislation is of benefit to all and second it is probably not known by other groups that it

is contemplated. The combined power of the federated outdoor clubs will represent the digested and crystallized opinion of some of the best thinkers in our country in their various fields of outdoor work. It will be a meeting ground at which the relationship of every move to the good of the whole will be tried out and if good will be stamped with the approval of the federation and receive its support.

Legislation that has long been needed, legislation that has been sponsored by a limited group of lovers of the outdoors, legislation that does particular good in one outdoor field but which has a direct bearing on many, will thus be made possible through the unbiased actions of the federation. The harm that will be done by such a federation is practically nil. If there be harm in it it is not apparent on the surface. The greatest menace to the entire idea and the structure is the securing of the balance of power in it by one group that has some selfish, partisan motive behind their activities. This is the only way that it would seem possible for the federation to become anything but a great movement for good.

It will be opposed by certain groups. It will be fought by those who expect to get something from the natural resources of the country for their personal benefit. Those in political power may try to wreck it for their own ends. But if there is a real core of genuine Americans in such an organization, a public-spirited group of genuine lovers of our great outdoors, it will take considerable pressure, unusual craftiness or other insidious force of moment to smash the organization.

The Federation of Outdoor Clubs of America or whatever agency may gather together and mould into one great purpose all the effort of the outdoor clubs of the nation, has its work cut out for it. It has an opportunity to do a great service to mankind and especially to the members of the organization within the federation. Only a debasing of ideals, a manipulation of its power to private or partisan ends will make it anything but a national force for good. Its work first consists of educating its own federated members as to what they, in their various

organizations are trying to accomplish. Second, it will then have to educate these same people in the relationships which exist between all outdoor activities. The interdependencies of all of the various children of nature should be brought home to all that all may see they are naturally related. After educating the federation members there is the immense field of education to be covered with the general public. The combined efforts of all will go further towards increasing the knowledge in each division of outdoors than the unaided efforts of a single organization. The opportunity for good in this field is almost unlimited. There is scarcely a thing done compared to what should be done and there is needed a centralized, strong force to bring about this general education of the public now so earnestly sought by each outdoor club working alone.

The federation has been pointed out as an ideal medium of exchange of ideas. Its bulletins or publications should always carry either a digest of all of the best articles, reports or pamphlets issued by various outdoor agencies or at least a list of such articles.

Finally, the great power of the federation to bring about good through directing constructive legislation can hardly be estimated. When its members can see that it is really "all for one and one for all" in the outdoor activities everyone will cooperate to bring about constructive legislation or to kill completely, destructive, malicious attempts to raid the outdoors.

The whole move has a direct bearing on forest recreation. Outdoor recreation is but a human use of the rural areas whether in forest, lake or field. It is recreation that brings many in contact with nature and her children. Outdoor recreation cannot but benefit from a thorough understanding of all outdoors by all people interested, for it is touched by practically every field of outdoor activities. But it is believed that this is so of every outdoor activity. Each must benefit from benefit to another. The federation cannot do otherwise than help all.

WOODLAND MAGIC

Up in town, when Jones is dining,
Nothing seems to please his taste;
He's a poor dispeptic, whining
At each dish before him placed;
He's a cynic, culinary;
Analyzes every bite,
And he eats like a canary,
For he has no appetite.

But in camp, when bacon's broiling
In a grease-bespattered pan,
And he sniffs the coffee boiling
In a battered, blackened can;
When he scents the smoke emerging
From a blaze of pungent pine—
Then his palate needs no urging,
And his appetite is *fine*!

Up in town, when he betakes him,
Drowsy-lidded to the hay,
Sleep, the goddess, doth forsake him
In a most provoking way;
He can turn and twist and mutter;
Fuss and sputter—but alack!
Sweet repose has vanished utter
From the poor insomniac.

But when balsam boughs are scattered
On the woodland's balmy breast,
And a blanket, mud-bespattered,
Forms the haven of his rest,
He can lie down, without fussing,
Near a water-fall that roars,—
And keep everybody cussing
With his loudly booming snores!

—JAMES EDWARD HUNGERFORD.

In The Giant Forest Of The Sierras

By Alexander Blair Thaw

Ye first of living things!
Ye that were goodly trees
When the great King of Kings,
Building his garden wall,
Brought down to Babylon,
Upon her streams the tall
Cedars of Lebanon.

Ye mighty trees!
Ye which are first, of all
Kings of the wildwood!

Over the earth and seas
Here we are come at last,
Weary with wanderings,
Down at your feet to fall;
Here, by your mountain springs,
Silent and all alone,
Through the long ages past,
High on your granite throne
Ye stood in your glory.

Mighty ye grew in girth,
Brother by brother
Bending your mighty knees
Down to the lap of earth,
While the great mother
Still to your listening ears
Whispered her story,
Tales of our wandering years,
Tales of our childhood.

Ye guardians who treasure
The gracious gift of rain,
And still pour forth again,
Age after age, and year on year
In bounteous measure,
Your everlasting fountains!

Up to these mountains,—
Where evermore you stand,
Great sentinels
O'er all this virgin land,
Guarding your sacred wells,—
We come, to drink of these.

Close by the tree of life
The tree of knowledge grows;
And, through our wars and strife,
Up from the world's deep woes,
Where the dark roots entwine,
Is born the Word divine.

Out of much suffering
Still those mute altars rise,
Where perfect love shall bring
Life's willing sacrifice,
And little children bear
Earth's holy promise there.

Now, through the least of these.
Heaven on earth is come;
Now the dark forest trees
Speak, and no more are dumb,
And a child's heart shall be
Fruit of this fertile tree.

Hark, in this burning bush,
Brought from the silent grove,
Out of that holy hush
Wakens the word of love,
Which o'er the world, new-born,
Hovers, this happy morn.



TOWN FORESTS

By J. W. Toumey.

Dean of the Yale Forest School

(Address delivered before the Massachusetts Forestry Association.)

THE two broad classes of forest ownership are private ownership and public ownership. Most Americans know something about public ownership due to the establishment and the placing under management of more than 150 million acres of National Forests within the past thirty years. When we Americans speak of public forests we think of the National Forests. However, some of the states in recent years have established state forests. Here we have another kind of public ownership. In states like New York and Pennsylvania, with a million or more acres owned by the state, public forests convey the idea of state owned forests. Nowhere as yet in this country does the idea of public forests bring to the mind of the average citizen, community owned or town-owned forests. As a nation we emphasize National Forest ownership. We are beginning to talk about state owned forests. We have scarcely begun to think in terms of town-owned forests. Yet with all this the town, a relatively small governmental unit, is in position to derive more pleasure and profit from a well managed forest of its own within reach of its population than can be derived from either a state or a national forest.

We should in this country, begin to think in terms of public forests owned by communities; that is, by towns, cities, schools and similar organizations that have an indefinite lease of life and which society has established for its own protection and welfare. We in this country differ from Europe in the way we look on communal forests. Over there, at least in many countries, instead of public forests being almost entirely under national and state ownership as they are here, a relatively large percentage is owned by towns, cities and other local organizations. The benefits derived from them are real and personal. These benefits can be experienced and appreciated much more than is the case with the benefits derived from national or state forests. For instance, every citizen in a town that owns a productive forest has not only the privilege of enjoying the forest in recreational pursuits, but he receives a dividend from the earnings of the forest in the form of remission of taxes. He is directly benefited by the protection which it affords and by the products which it provides. Not a few towns that own productive forests in Switzerland and Germany escape all town taxes due to the fact that the revenues derived from the forests are sufficient for the entire support of the towns. In the older countries of Europe communal forests are usually favored by the public over other kinds of public forest ownership.

In this country the bulk of our publicly owned forests is national. A limited acreage is owned by the states, and practically none at all is owned by the towns and similar communities. Switzerland has 67 per cent of all her forests under town or other kinds of communal own-

ership. Almost every city and town, almost every school and poor house, almost every church, owns a near-by forest managed for production of forest products, but also serving for protection and available for recreational purposes. Many of these communal forests are among the oldest managed forests in Europe. Some of the cities and towns, as illustrated by Zurich, spend as much as six or seven dollars per acre each year on their management and improvement. Yet they derive from them a net annual revenue as high as eight dollars per acre which goes toward the relief of taxation.

A few years ago Germany had 16.1 per cent of her total forest area in corporation or communal forests, largely owned by cities and towns. Many of these forests are among the most productive and the most celebrated in Germany, as illustrated in the town forest of Baden Baden and the town forest of Forbach, both in the celebrated Black forest region. Most of the town forests in this part of Germany were a few years ago, and are probably now, in a high state of productivity. Although located in rough mountain country, where the soil is wholly unsuited for agriculture, they sustain thriving permanent communities and yield a net annual revenue often exceeding eight dollars per acre, and in some instances, as is the case with the Forbach forest, as high as twelve dollars.

The old world has found that town forests pay not only in affording recreational opportunities and protection, but in the revenue derived from the sale of forest products. Old world cities and towns find it on the long run the part of wisdom to pay all the way from \$80 to \$300 per acre for forest property to be held as town forests. No one hears of town forests being disposed of to private owners, but one constantly hears of new town forests being acquired either by gift or purchase. In America our cities and towns, as well as other communal organizations, have entirely overlooked, up to the present, the great opportunities for forest ownership which lie at their very doors. Thousands of acres of idle forest land can be secured, often not far from cities or towns, often as low as from five to ten dollars per acre, with correspondingly higher prices for land partially or fully stocked.

Before the war, I gave some time and inquiry to the subject of city, town and school forests in this country, and from the data collected in ten states, where approximately 130 thousand acres of forest property was owned by sixty-seven communities, I came to the conclusion that a total of 250 thousand acres of communal forests for the entire country was a very conservative estimate. Since then no doubt the area has increased somewhat, but to what extent I do not know.

I believe it is safe to make the prediction that in the

(Continued on page 113)

BLISTER RUST APPEARS IN THE PUGET SOUND REGION

By S. B. Detwiler

THE first evidence of white pine blister rust was found last September, when diseased cultivated black currant bushes were located at Vancouver, B. C., by the Provincial plant pathologist. The scouting which followed brought to light infected cultivated black currants at a number of points on Vancouver Island and on the mainland as far south as Chilliwack, B. C. A few infected planted white pine and Cembran pine were found at Vancouver. In the State of Washington, during November and December, rust-infected cultivated black currants were found near Sumas City, Mount Vernon, Everett and Port Townsend. At Mount Vernon three small western white pines showed signs of young cankers.

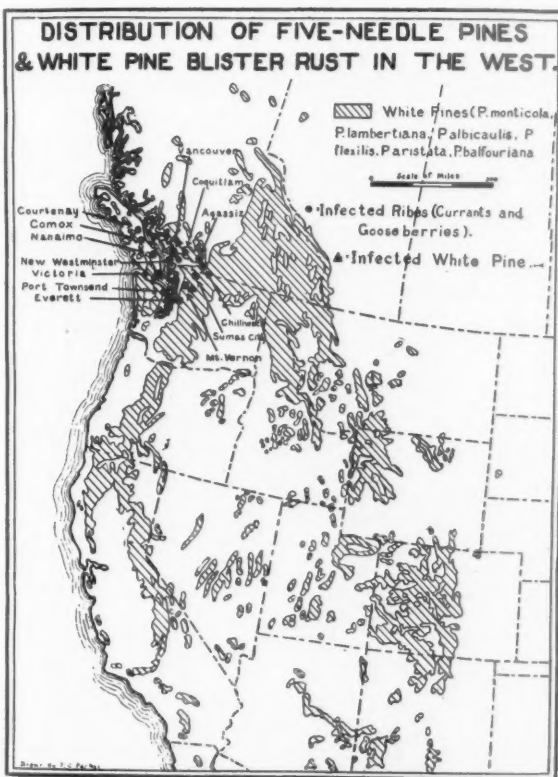
The presence of diseased black currants is a serious matter because it is only through the agency of currant or gooseberry bushes that the blister rust spreads from one pine tree to another. Fortunately, in the Puget Sound region, to which the rust infection appears to be confined, planted white pines are few and the native western white pines are sparsely distributed, forming less than one per cent of the forest. Wild currants and gooseberries are present throughout this region, but the one that is most common is known to be highly resistant to rust infection. Plants of other species are scarce except in marshy places.

All kinds of currants and gooseberries harbor the rust to a greater or less extent, but cultivated black currants are particularly susceptible to infection. At practically all points where the blister rust was found in the Far West, it was confined entirely to cultivated black currants. Only two bushes of wild currants were found diseased out of thousands examined, and the majority of black currants examined were free from the disease. This fact, and the age of the cankers found on the diseased pines, indicates that the blister rust was introduced recently. This is borne out by failure to find the disease previously, although considerable scouting has been done each year in the Puget Sound territory since 1917. At Vancouver the rust was present as early as 1916, before the establishment of the quarantine pro-

hibiting shipments of nursery stock of white pines, currants or gooseberries.

A conference to consider the best means of dealing with the blister rust situation was held at Portland, Oregon, on December 19-20, 1921. The conference was called by H. P. Barss, chairman for the Western Advisory Board of American Plant Pathologists, and was composed of about seventy-five representatives of lumbermen's associations, forestry and conservation associations, state foresters, agricultural commissioners, plant pathologists, railway officials, nurserymen and timber owners. Officials of the Canadian and British Columbia governments and members of the United States Department of Agriculture were in attendance at the invitation of the conference. The conference first

gave consideration to all available facts on the situation, and through a number of committees, worked out a plan of action uniting national, state and private agencies toward preventing the further spread of infection, and if possible, to stamp out the disease entirely on the Pacific Coast. Some of these measures consist of additional quarantine restrictions in Washington and British Columbia, the general destruction of cultivated black currants as a public nuisance in the Northwestern States, and the conduct of necessary investigational and scouting work as soon as possible. Cultivated valleys and a wide arid belt form a natural barrier to the spread of the rust from the Puget Sound region to the



principal commercial white pine forests of Idaho and western Montana. British Columbia has already placed the needed quarantines, and is contemplating scouting and other action to determine the best means of cooperating effectively with the western states.

The Western spirit of cooperation prevailed at the conference. The Pacific Coast Nurserymen's Association and railway officials offered aid in scouting for the disease and in quarantine enforcement. Several nurserymen voluntarily offered to destroy all black currants and white pines in their nurseries. State officials in Washington, Oregon, California, Idaho and Montana offered the serv-

ices of nearly one thousand employees to aid in control work for short periods aggregating about twenty thousand man-days and valued at \$70,000 to \$80,000. Forest fire associations offered similar help during periods when weather conditions permit. Lumbermen's associations stand ready to contribute funds and any needed assistance, as well as exterminating any blister rust infection found on their own or adjacent holdings. A committee consisting of W. D. Humiston, chairman; C. A. Clark, H. P. Barss and C. S. Chapman as executive secretary, was elected to carry out the plans of the conference. The general sentiment was that the situation was serious, but had many hopeful elements, and that prompt action will prevent general infection such as has occurred in the East.

The situation in the eastern white pine area is both darker and brighter. It is darker because the spread of blister rust infection has been so great during the past few years that the disease is now general throughout the white pine regions of New England and northeastern New York, and portions of Wisconsin and Minnesota.

The bulk of the white pines are still free from infection, but it can be found in almost any pine lot north of a line running from Boston to Lake George. The infection that hit the pines in 1919 was heavier than ever before, and the results will be serious to the pine in the infected regions if currants and gooseberries remain in proximity to the pine. The principal danger lies in pine owners remaining in ignorance of the true conditions until it is too late to save the existing pine crop.

The bright side of the situation is that the results of control work done in 1916-18 prove conclusively that the blister rust can be effectively controlled at moderate cost. The methods are simple to learn and any white pine woodlot may be protected. All that is required is to pull up wild and cultivated currant and gooseberry bushes that grow within 900 feet of the pines to be protected. Investigation during the past year has shown that this action is entirely effective in preventing further ravages of the blister rust in those areas where the work was done systematically.

OUR VANISHING TIMBER SUPPLY A SERIOUS PROBLEM

THE outstanding points in our present serious situation as to timber supply are the disappearance of three-fifths of the virgin forests of the country, a present drain upon our remaining forests over four times their yearly production of wood, and the accumulation of enormous areas of denuded and idle forest lands," says Chief Forester W. B. Greeley in his annual report to the Secretary of Agriculture.

"The past year," according to the report, "has been notable for general discussion of the forestry situation in both its national and local aspects and the consideration of remedies. To a considerable degree this discussion has centered around proposed measures of Federal legislation.

"It is increasingly evident," says Colonel Greeley, "that whatever legislation may be enacted and whatever governmental agencies may be involved, two principles must be recognized in putting the United States upon a self-sustaining basis in timber production. The first is that, because of the long-term nature of timber crops and the foresight necessary to meet future national needs, the public has an interest in forest lands not common to most forms of private property and most comparable to its interest in the operation of recognized public utilities. This public interest must be satisfied in the manner of handling forest lands. The second principle is that the production of timber is an economic process, governed by economic laws.

"The State or the Nation may insist that forest lands be productive rather than idle; but in so doing it can not avoid its own responsibility for reducing the general risks and losses attendant upon timber production, which have often made it a hazardous or unprofitable undertaking. The two outstanding respects in which public co-operation with the land owner is necessary, as a

corollary to regulating the use of his property, are organized protection against forest fires and the adjustment of taxes on timber lands so as to secure their employment for growing successive crops.

"The Forest Service has initiated this year an important step toward the restoration of America's forests," declares the forester. "This is a comprehensive study of the requirements in protection and reforestation necessary to keep forest lands productive in each important region of the United States. This study has been undertaken in co-operation with the State foresters, timberland owners, representatives of forest industry organizations, and forest schools. Its purpose is to put in concrete terms just what 'forestry regulations' mean, in the southern pine belt, Appalachian hardwoods, or the Lake States. Instead of dealing in general terms, it will bring the forestry movement down to specific things which are to be done in the woods, as minimum standards.

The subjects for Federal legislation now most urgent, according to the Chief Forester, are:

(1) The extension of Federal cooperation in the protection of all classes of forest land from fire; such co-operation not to be limited to the watersheds of navigable streams, as at present, but to be available on all forest lands within States prepared to join in co-operative efforts. (2) The extension of public forest ownership by incorporating within National Forests public lands not under Federal ownership or control which are adapted primarily to growing timber or the protection of watersheds; by acquiring cut-over forest lands within or adjoining National Forests through exchanges; and by purchasing forest lands with a view both to the protection of navigable watersheds and to the restoration of forests on areas now denuded and idle.

BROAD-LEAVED EVERGREEN SHRUBS FOR THE SOUTH

By F. L. Mulford

IN passing from northern Canada southward, there is a transition from forests composed almost entirely of coniferous evergreens to those in which there are a large proportion of deciduous trees, while along the Gulf of Mexico many broad-leaved evergreens are found mingled with the others. Where the country is covered almost exclusively by coniferous evergreens the firs and spruces largely predominate. When the latitude is reached where many deciduous trees are to be found the pines and hemlocks become the more prominent species, but where the broad-leaved evergreens appear plentifully in the native vegetation only a few species of coniferous trees are to be found.

Wise planters observe these natural tendencies and adapt their planting schemes with these facts in mind. The style of the design and the purpose of the planting is of course of major importance, but on the other hand all plant material must be adapted to the place where it is to be grown in order for it to succeed. If a strictly formal planting is to be made the natural conditions may often be so modified that entirely different plants may be grown than could be grown under the usual conditions of the immediate neighborhood. Formal land-

scape design presupposes adequate gardening attention and skill in maintenance so that unusual plants for the neighborhood may be successfully grown where it is more appropriate for the effect to be produced that these should be used. On the other hand, where only a minimum of care or skill is available for maintenance then informal design with native and other easily handled material is almost imperative.

There are many intermediate gradations of relationship between the strictly formal design with strictly formal plantings and the informal design with informal plantings as for example the formal design in which the details of the plantings are informal. In spite of the plantings in such a design being designated as informal they must have much more attention than informal plantings in an informal design. Although a spirit of informality is admissible in such plantings, on the other hand the plants are closely associated with formal lines and therefore may not become too rampant for their location and yet on the other hand must not lag unduly or there is an apparent gap that spoils the effect. Although less work is required to maintain such plantings than strictly formal ones a high degree of intelligence is needed



AN OLD-FASHIONED GARDEN WITH BOX-EDGED WALKS

The dwarf box is intimately associated in the common mind with the delightful old-fashioned gardens found on so many of the old colonial homes in the South, where it is almost invariably found edging the fragrant, spicy flower beds.



A GOOD INDIVIDUAL SPECIMEN OF THE TREE BOX

The tree box is often used as a hedge in gardens, but is quite as well adapted to clump or individual use, the foliage holding its beautiful, shiny color throughout the year.

and the plants must be well chosen for the conditions to be met.

In the Southern States as in other parts of the country plantings should include a liberal amount of evergreen plants so that the winter landscape will be interesting as well as that of other seasons of the year. Although the shorter winters make a shorter season in which the deciduous plants are without foliage than farther north yet the season of denuded branches is sufficiently long to require attention especially when planning for home surroundings. Then too, frequently balmy days during the season seem to make a special appeal for foliage to be in evidence. Although the coniferous evergreens native to this region are comparatively few and introduced species that succeed are correspondingly scarce, yet there is a wealth of attractive broad-leaved evergreens that more than compensate for the few species of the conifers that do well under the conditions.

One of the best known of this class of evergreens for the south is the box. This is associated in the minds of all with the old time gardens and is to be found in many of those that date back a hundred years or more. It is not exclusively a southern plant as it will grow even in New England in favored spots. There are two distinct types; the one popularly called box bush (*Buxus suffruticosa*) being a low growing shrub with small leaves, but with age some times attaining a height of seven feet, the other called box tree (*Buxus sempervirens*) is a much larger shrub with longer and relatively narrower leaves, the plant with age sometimes attaining a height of fifteen to twenty feet. The foliage of the dwarf box is a lighter

green than that of the tree box, but both are rather shiny and keep their characteristic color throughout the season, not varying as with many evergreen plants. Both plants are largely used for hedges and are also well adapted for use as clumps and as single specimens. The tree box has been used as a hedge in many of the old gardens and through neglect at some time in their life the bushes have grown clear above the walks and covered them over, leaving the walk in an arch of green. From the walk the trunks and branches of the bushes may be seen with the foliage beyond, while from without there is simply the mass of green foliage. These plants both withstand pruning well, and will even recover from very severe pruning. They are of slow growth and for that reason are often of more value than more rapid growing plants.

Another of the better known broad-leaved evergreens is the azalea. There are two distinct types of these plants grown in the south. One is the dwarf hardy evergreen azalea (*Azalea amoena*) a low shrub two to three feet high with small leaves that turn bronze in the winter. The plants are thick and bushy and form good, low ornamental hedges. The flowers are purplish red, borne in great profusion during a period of nearly or quite three weeks. It is hardy all through the south and north into New England. The other type is the Indian azalea (*Azalea indica*). This species has a large number of varieties that vary from white to all shades of pink, red and purple, with splotched and striped forms in both single and double flowers. The leaves are much larger than in the dwarf azalea and a dark green. There is a great difference in the hardiness of the different varieties, one of the sub-



DWARF EVERGREEN AZALEA

This is a low shrub (*Azalea amoena*) splendid for ornamental hedge use. The plants are thick and bushy, with purplish red flowers and small leaves that turn bronze in winter.

species known as *alba* being hardy as far north as Boston, but many of the varieties will not stand the conditions far from the South Atlantic and Gulf coasts. Some of the varieties, with age, under favorable conditions, attain a height of twenty feet or more, while others normally attain a height of only six or eight feet. There seems to be little information available as to the different varieties and practically no firms attempt to handle named varieties of the types common through the south. The named varieties on the market are largely of recent European origin or at least of recent importation. It would seem well worth while for a study of the existing varieties to be made and the best of them to be

propagated and put on the market in a systematic way.

A favorite evergreen in the warmer parts of the south

from Wilmington, North Carolina, southward along the Atlantic and westward along the Gulf of Mexico is the

Camellia (*Camellia japonica*) known widely as *Japonica*. Camellias are handsome, sweet-scented flowers in white and various shades of pink and red, with various mottlings and pencillings in single, semi-double and double forms. They are waxy in appearance and the leaves are a bright shiny green.

The American holly (*Ilex opaca*) is an evergreen tree that is well known throughout the south, where it is native, and in the north, where it appears on the market in large quantities at Christmas time for decorations. Although this makes a large tree it can be used where a hedge is

desired, as it will withstand severe pruning well. However, where a shrub or smaller growing plant is desired



THE LARGE EVERGREEN AZALEA

The beauty of the azalea in bloom, which is luxuriant and persistent. The foliage turns a rich bronze in winter.



EVERGREEN PRIVET AMONG DECIDUOUS SHRUBBERY

Keeping the garden places green all winter, this shrub is familiarly known by its thick, dark, shining leaves and its beautiful berries, which attract the birds all winter.

than the American holly the English holly (*Ilex aquifolium*) may be used. This will hardly attain a height of over twenty feet and it has the same lustrous foliage. There are many named varieties of the English holly each with different shape of leaf or habit of growth, so that almost any reasonable desire could be gratified. In general, however, the leaves are very much like the American holly and it has the added attraction of bearing red berries in even greater abundance than the American holly. It, like the American holly, bears the staminate and pistillate flowers on different plants so that to insure berries it is important to have both sorts of plants close to one another. These may be obtained either by purchasing trees that have been grafted from trees that have the characters that are desired, or by selecting the appropriate plants after they have reached sufficient size to flower and show their characteristics. This holly is not hardy much north of Washington.

The Japanese holly (*Ilex crenata*) is a small holly that has many small branches more suggestive of the Japanese barberry than the other hollies in its general character of growth. The leaves are small, suggestive of boxwood, and wavy edged instead of being sharp toothed. The berries are black and therefore not showy like those of the other two plants just mentioned. An attractive native holly is the Yaupon (*Ilex vomitoria*) or casena that is much used along the Gulf as a hedge plant and also makes an attractive individual specimen. Its leaves are wavy edged like the Japanese holly without the prickles of the English and American hollies. They hang on until the new leaves are about to appear, so it is hardly a true evergreen. The berries are scarlet and very abundant. It is native near the coast from Virginia southward. It attains a height of twelve or fifteen feet. Another similar native holly is the Dahoon (*Ilex dahoon*), which also has spineless leaves that are shed just as the new leaves appear. It is native farther inland than the yaupon as well as in the same area. This, too, makes almost a small tree. Another native holly that is truly a shrub is the gall-berry or ink-berry (*Ilex glabra*). This is a true evergreen with

dark shining leaves. It grows to a height of two to four feet and has an abundance of black berries.

In order to successfully transplant the American holly it is essential that all the leaves be removed at the time of transplanting and the same practice should be followed with the other native hollies and it would probably be best to treat all the hollies in the same manner unless it is possible to get nursery grown plants with unusually good balls of earth about the roots.

The evergreen euonymus (*Euonymus japonicus*) is a dense upright shrub with large, glossy evergreen leaves with slightly wavy margins. It attains a height of eight feet, but is rather formal in outline. The leaves hold their lustrous color all through the winter even as far north as New York City. There is a form that has leaves variegated with golden yellow. Where a variegated plant is warranted this is one of the best. There is also a dwarf form with small narrow foliage known as the small leaved evergreen euonymus (*E. japonicus microphyllus* or sometimes *E. pulchellus*). It is useful in foreground planting or for low borders or hedges.

The Japanese privet (*Ligustrum japonicum*) is very similar in appearance to the evergreen euonymus just mentioned and has similar uses. The leaves, if anything, are somewhat darker and sometimes the mid-rib and margin are reddish. The flowers of this shrub are almost white, followed by bluish black berries. It will ultimately attain a height of twenty feet or more. Another Japanese privet is *Ligustrum*

lucidum, which has thick dark shining leaves that are also very attractive. It does not get quite so large as the one just mentioned. Another smaller Japanese privet with immense dark green leaves is *Ligustrum microphyllum*. This attains a height of 12 or 15 feet.

Among the best known of the characteristic southern plants to the casual visitor is probably the cape jasmine or gardenia (*Gardenia florida*). This is a small shrub with dark glossy green leaves and exceedingly fragrant, handsome white flowers. The shrub attains a height of six feet and bears flowers all summer. It is not hardy north of the coast region of Virginia and the less mountainous sections of Tennessee. There is also a dwarf



THE HOLLY-LEAVED TEA OLIVE

This is found hardy as far north as Washington. The edging is the variegated form of the creeping euonymus.

form known, *Gardenia radicans*, that is most useful where a low plant is desirable.

The Carolina cherry or the mock orange of the south, especially of the Carolinas (*Prunus caroliniana*) is a small evergreen tree with rather large dark green leaves. It bears panicles of small white flowers in spring which are followed by small black berries in the fall. It is adapted to planting as single specimens, in clumps as screens or back grounds, and also as hedges as it responds to pruning well. When permitted to grow as a tree it will attain a height of more than twenty feet. In some of the towns in South Carolina it is occasionally found as a street tree, although it is too small a tree for this purpose.

The Tea Olive, Sweet Olive, or Fragrant Olive as it is variously called (*Osmanthus fragrans* or some times *Olea fragrans*), is valued for its very sweet odor in connection with its clusters of rather small white flowers and dark evergreen foliage. It should be used where a plant under six feet in height is desired. A close relative of this is the holly-leaved olive that has leaves much like the holly and whose habit of growth is similar to the English holly. This plant bears fragrant small white flowers in autumn. It is hardy as far north as Washington, while the tea olive is not hardy much north of Wilmington, North Carolina.

The Japanese laurel or aucuba (*Aucuba japonica*) is another low growing plant that is useful for home ground planting. This also attains a height of about six feet under favorable conditions. It prefers partial shade and an abundance of moisture. There is a variegated form that is probably better known than the type or green form. This is beautifully marked with yellow and when used sparingly either with the green-leaved form or with masses of other evergreens attractive results can be obtained. It is well to plant the aucuba in groups so as to insure having both pistillate and staminate plants in order that they may bear the showy scarlet berries that hang on for a long time. This plant seems to withstand city conditions remarkably well. There is another species, *Aucuba viridis*, with narrow leaves and more dwarf habit, which is hardy as far north as Washington.

The English or cherry laurel (*Laurocerasus*) is known by several species in the warmer parts of the south, all of which are very attractive and are highly prized by those who possess them. They will thrive in the eastern part of North Carolina and half way or more across the other states south of there that border on the Atlantic or the Gulf, including a fringe of Texas. Some of the species of English laurel are *Laurocerasus Bertini* with very broad dark green foliage; *L. colchica*, with foliage having a dark green upper surface and a gray green beneath; *L. caucasica*, with large broad foliage of a light green; *L. viridis*, with short broad light green leaves. These plants are of vigorous growth in any ordinarily good soil and are of easy culture. The foliage is shiny and they are well suited for screens ten or twelve feet high.

The laurel of classic countries is still another plant and is also known as Bay Tree (*Laurus nobilis*). This is perfectly hardy over a good portion of the South and makes a handsome small tree. It responds well to pruning, as is shown by the way it is used in formal gardening, where sheared specimens are required. Even in the north, where it is necessary to winter them under glass, large numbers are used for the sake of the summer effect they will produce. They are grown largely in tubs in the north, but in the south this is not necessary, as they can be wintered in the open ground without protection.

Another laurel that is of great value in all parts of the south but the warmest portions and the limestone



AUCUBA JAPONICA, OR JAPANESE LAUREL

There is also a variegated form of this lovely shrub, known by its striking yellow markings. A fine plant for the home grounds bearing showy, scarlet berries.

regions is the Mountain laurel (*Kalmia latifolia*) a native of many parts of the south and as handsome a plant as any that have been mentioned in this article. The foliage is good size and of a deep glossy green, not as large nor as dark as many of the plants described. In late spring or two or three weeks after the oaks come into leaf the bushes are covered with little cluster cups, pink outside and white inside. The plants will grow well in dense shade, but bloom best where they receive an abundance of sunlight.

The photinia (*Photinia serulata*) is a dense shrub or small tree with large leaves of unusual texture or surface, which give it a sort of velvety appearance with a mix-

ture of sage green and suggestion of brown with reddish tinge to the midrib and larger veins, the whole foliage becoming more markedly red late in the season. It bears small white flowers in large corymbs in early spring.

Another unusual and attractive plant is the strawberry tree (*Arbutus unedo*). It attains a height of fifteen feet, has glossy, dark green foliage and bears white bell-shaped flowers in abundance that are followed by red fruits that hang on until late the following winter.



THE BEAUTIFUL JAPAN OLEASTER

With their lovely silvery undersized leaves the oleasters give decided variety from the invariable dark shades of the evergreens.

Throughout the north the Virburnums are among the most useful of deciduous shrubs, including several native species of great attraction as well as the common snowball, a double form of a European species. In addition there are two Japanese varieties that are deservedly popular. But for the South there are three evergreen species that are even more attractive than their deciduous relatives. Probably the best is the laurustinus (*Viburnum tinus*), which attains a height of ten feet with medium-sized, glossy leaves. The red buds begin to appear in November and keep getting larger and redder through the winter, opening about February into creamy white, fragrant flowers that remain open a long time. Two other

good species are *V. suspensum* and *V. odoratis simum*.

Another valuable genus of plants for planting with those already mentioned are the Japan oleasters because the foliage gives variety from the dark greens so much mentioned. Simon's oleaster (*Elaeagnus simoni*), is silvery on the under side and when the leaves are moved in the wind it makes a very attractive contrast to the dark tone of many of the evergreens. *Elaeagnus pungens* has this same characteristic, as does also *Elaeagnus macrophylla* which has large leaves with wavy edges. Two small leaved varieties without so characteristic an under color are *E. microphylla* and *E. buxifolia*.

The Japanese Pittosporum (*Pittosporum tobira*), is a representative of a large group of plants used effectively in California. It succeeds well in the South and is well worthy of culture as it can be used as a hedge or wherever severe pruning might be required, as well as for a specimen in the open.

The Japanese Nandina (*Nandina domestica*) is another



CREEPING EUONYMOUS USED AS A GROUND COVER

This is the dwarf form of the plant which is often used in foreground planting or for low borders or hedges.

er plant that will relieve the severity of too much dark green. It has several reed-like stems from the same root, the young leaves being tinged with red while the winter foliage is bronze. The flowers are white followed by bright red berries that hang on all winter.

BADGERS AND WOLVERENES

By R. W. Shufeldt

(PHOTOGRAPHS BY THE AUTHOR AND OTHERS.)

IN the North American fauna we have the American badger, the California badger, the Mexican badger and the Santa Anita badger. Essentially, they present the same anatomical structure, while their differences are chiefly to be found in their sizes and in the color-variations of their pelts. Our American badger is the type of the group.

Badgers are, for the most part, clumsy animals, with stout and squat forms, as though they had been flattened out from above, downwards; and this flattening includes both head and tail, the latter being rather stout and broad. The fur is fairly soft, with a general diffuse color-

present article, we may select the photograph of an unusually large male American badger, which the writer collected at Fort Wingate, New Mexico, on the fourteenth of August, 1887. This animal was thirty-two inches in length, and presented the markings of a typical American badger, although it was shot well within the range of the Mexican form.

Badgers live in burrows which they dig themselves; and in some parts of the West the writer has seen these burrows very numerous in small areas. Although they were all the work of badgers, many of them had been dug to secure gophers, prairie marmots, mice, and other



THE BADGER OF SOUTHWESTERN UNITED STATES

This specimen was collected by the writer in New Mexico many years ago, and the photograph shows very well all the characters of the animal. Note that the black patch is *in front* of the ear and not behind it.

ation, distinct markings occurring, as a rule, only about the head. Being inveterate diggers by habit, they have stout legs, with feet armed with immense claws, especially the forefeet.

It has been the writer's good fortune to study badgers in various parts of the United States, from the Yellowstone River to New Mexico and Arizona. He has had them alive for a long time; shot, dissected and described them, and studied them in nature and in zoological gardens. Large series of skins have also been studied in museums and in private collections. To illustrate the

rodents, upon which they prey; and these burrows, often covering several acres or more, are a source of constant annoyance and actual danger to travelers on horseback in those regions. The writer remembers riding over the prairie at full speed on one occasion, with a shotgun in his hand, held at the grip; his object was to surprise a flock of geese that had come down in a slough behind some cover, and this was a favorite method of hunting them on the prairie. When within one hundred yards of the slough his horse ran one of its forelegs deep down into a badger burrow, the shock



AN OLD BADGER OUT OF HIS BURROW

This figure gives a very excellent representation of the animal as it walks. Observe that the feet are semi-plantigrade, or very like those of a bear. (From A. C. Gould's "Where to Hunt American Game.")

threw the writer clear over the horse's head; and, as he landed, his gun struck the ground on the end of the muzzle, completely shattering the stock at the grip. However, the horse was on its feet again in an instant, luckily unhurt, as the soil was very soft and had given way before its stiffened limb.

It is said that where the food supply is unusually abundant, and other conditions are good, badgers will come together in large numbers, but personally the writer has never seen anything of this kind, and it has been his experience to have met with not more than eight or ten families living in one community, covering a limited area. Scores of burrows were present, but the majority of them were far too small to be occupied by badgers.

These creatures are shy and timid by nature; still, when the even tenor of their way is interfered with, they can be extremely ugly animals to handle and overcome. None of the *Canidae* found in this region especially care about engaging one in an encounter, as it is quite likely that the badger would come out victorious. His jaws have a tremendous grip and power; and as for any other animal attacking one in its burrow, no such case is known in so far as the writer is aware. In fact, its principal enemy is man, who destroys it by the thousands for the sake of its pretty pelt; and the hair of the badger has long been used for the blenders of artists, for shaving and for other soft brushes.

But on the other hand, badgers are, in a way, useful to man, as they destroy untold numbers of destructive rodents; and the insects, snails and snakes that they occasionally prey upon may or may not be man's best

friends from an economic standpoint. In unsettled parts of the West the badger is ever on the increase; but he is being gradually exterminated as the country settles up, although the chances are that he will hold his own for an indefinite length of time in many localities. When his usual bill of fare runs a little short he finds no trouble in subsisting upon small birds, if he can manage to capture them on their nests; or, he will eat their eggs. He will also eat some kinds of fruits and roots if need be.

Badgers are rarely seen out of their burrows in the daytime, and this is the reason that, traveling over the western plains, one so seldom sees a badger, although their burrows are very numerous and every indication exists of the presence of these animals. They chiefly come forth at night; and it is the rarest thing in the world to find a pair together on this occasion—day or night. For some reason or other, the sexes pursue their avocations usually apart. In sections where they are plenty, we may occasionally catch an old fellow away from his stronghold, when he will be seen to literally flatten himself out like a big, soft-shelled turtle. In this shape he will squat down and look like a little mound of grayish earth, and the horseman has passed him for such many a time. If not too far away to make a run for it, he will try to creep cautiously back to his den unobserved, but this attempt sometimes costs him his life.

Many years ago, when hunting in Wyoming, the writer once surprised a large badger in this way, but did not sight him until he was within about twenty feet of his burrow. The piece carried on this occasion was a double-barrelled shotgun, loaded with buckshot. The shot fired at him apparently wounded him in several places, for he made the dust and stones fly as he rolled over and over in his rage. However, he suddenly pulled himself together and actually got into his burrow before a second shot could be given him, or before he could be headed off. Sometimes when one runs into his burrow, he may suddenly appear again in a moment or two at its entrance to inspect the intruder; and the writer has seen



THE SKULL OF AN OLD MALE BADGER

The badger's skull is built along the line of great strength, and it has a wonderful set of teeth. Note the small, shallow orbit and the peculiar articulation of the lower jaw. Not only can the animal give a fearful bite, but it can hold on to its victim with great tenacity. (Considerably reduced.)

Indians take advantage of this habit by running up to the burrow and deliberately kill the animal with a pistol shot as he showed his head. In those days Indians used also to frequently capture them by running upon them on horseback, dismounting as near as possible, completing the chase, and catching them on foot.

The captive badger which the writer had at Fort Wingate, New Mexico, was an old one, and soon became quite tame; when in good humor he allowed one to stroke and handle him. He was fed principally upon raw meat, but he ate nearly everything that was offered him; moreover, he was very fond of water, and he drank a good deal of it. He has seen Indians eat badgers, but they will also eat skunks and the uncooked intestines of wapiti and buffalo—or rather they did, when buffalo were plenty. Having often skinned both old and young badgers, the odor that came from them was quite enough to deter the writer from ever entertaining the idea of dining upon them, however served. This odor is rank and foul to the very limit of one's imagination.

In regions where they have severe winters, badgers probably remain during the cold spell in a more or less dormant state within the stronghold of their deep burrows; but they are quite fat, however, when they appear in the spring. At this time it is an easy matter to drown them out of their dens, as the ground is frozen and hard, and the water runs straight to the bottom of their burrows; the poor, surprised creatures must come to the sur-

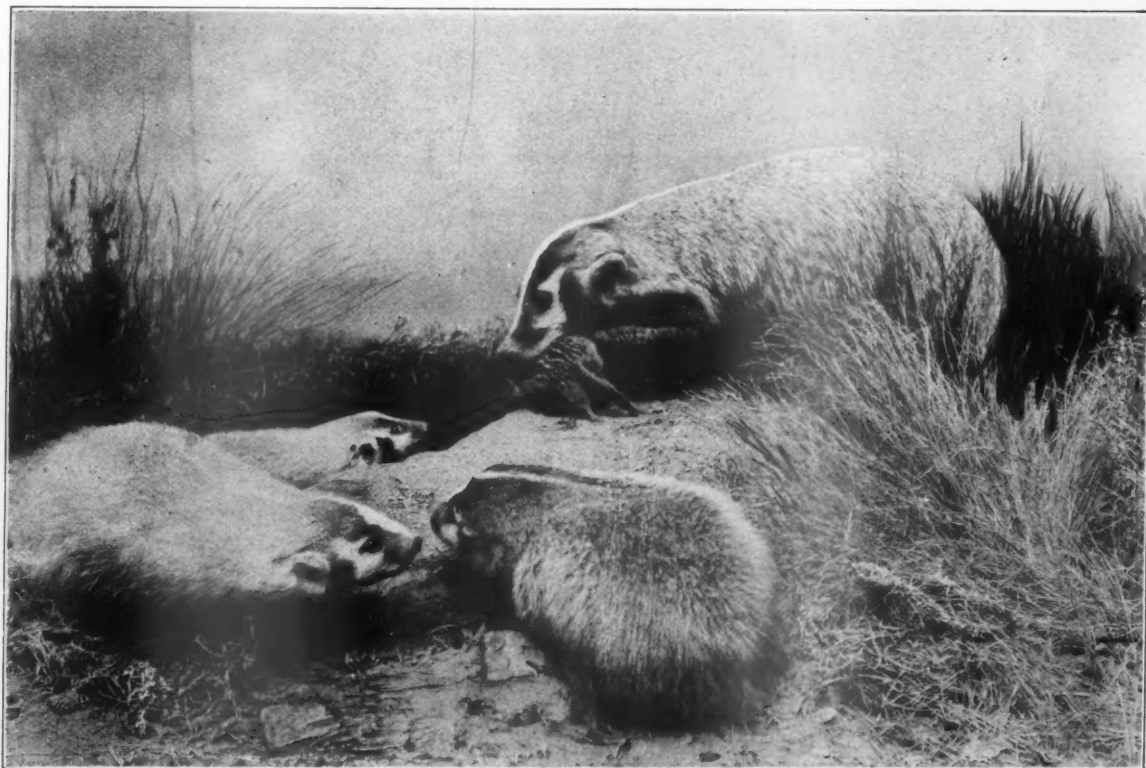
face—so it is death to them either way. There is more of an excuse for this interesting animal to hibernate than for his remote relative, the bear; for what could a badger find to eat after the winter had set in? Surely, no grasshoppers or other insects, and no snakes. Then, too, the ground is as hard as flint rock, and it would take him more than a day to dig out any of his rodent neighbors, even were he able to do it at all. Good, sound hibernation is his only salvation.

Badgers are sometimes caught in steel and other traps; but it takes a very expert trapper to accomplish this, and even such will fail nine times out of ten.

Beyond the mere fact that the American badger mates in the spring, little or nothing is known about the reproduction of this species or its congeners. The reader may have seen very young ones in zoological gardens. So far as one can judge, there seem to be three or four to the litter, and they make their appearance occasionally during the daytime.

A red badger was once seen by the writer; but he was wet, and had been digging in red clay; and no doubt albino badgers have existed—perhaps, too, cases of melanism have occurred among them, as all mammals are subject to these peculiar states, though no examples may ever have been seen by man.

The author of "Fur-bearing Animals" has aptly called the badger a "timid" animal. And "so it is, in the sense that it avoids rather than confronts impending danger;



AN OLD BADGER WITH A FAMILY OF THREE

The writer obtained the photograph of this group in the Mammal Hall of the United States National Museum. It was mounted by the late Mr. William Palmer, and through the courtesy of the Museum's authorities it illustrates the story of the badger's home life as here told. Note the Striped Prairie Squirrel the old one has in its mouth.



THE SKULL OF AN OLD MALE WOLVERENE

In proportion to its size, the wolverene possesses a more formidable set of teeth than a grizzly bear; in fact, the entire skull of this animal is a structure of the most massive character, to a greater degree than in any other mammal of its size in America. (Reduced one half.)

but this is simply the instinctive prudence and discretion of a creature which prefers the absolute immunity of its subterranean resorts to the chances of unequal combat in which it is at disadvantage. Certainly no lack of courage, determination and physical endurance is seen when the creature, captured or cut off from its retreat, is brought to bay. Its pluck is then as conspicuous as its really formidable strength. The cruel sport of 'badger-baiting' is sometimes indulged in in the West; and if the animal be given a barrel or similar retreat in which it is secure from attack in the rear, it may prove more than a match for a strong dog. Indeed, the fighting qualities of the badger, and the stubborn resistance it offers at whatever unfair odds, have supplied our language with a word of peculiar significance: to 'badger' is to beset on all sides and harass and worry. The stout, thick-set and depressed shape of the animal is greatly in its favor, combining with the long, loose hair to prevent a dog from reaching vulnerable parts, and to embarrass it in attempting to take hold; the snap of the jaws inflicts a serious wound; and, finally, the tenacity of life is at a high rate."

The range of the American badger extends from north latitude 58 degrees southward to Oklahoma, and westward to the Rocky Mountains; and formerly it was found as far East as the state of Ohio.

There appear to be three species of wolverenes in the North American fauna, and they occur in various areas in Alaska, British America, and the United States. There is also an European species whose form and habits are almost identical with our species; it occurs, too, in northern Asia, and some zoologists consider this Old World form the same as the common American one. The habits of the various species are pretty much the same everywhere, while the form to be referred to here is the one occurring in the United States.

This big, bear-like animal is also known as the Glutton and as the Carcajou. Its hair is long and shaggy, and the creature walks on the soles of its feet. Its general color is a blackish brown, described by some as a deep purplish brown; this is generally lighter on the top and

sides of the head, while a chestnut brown band, commencing at the shoulders, passes backwards along the sides to meet on the rump at the base of the tail. The feet, legs and under parts are blackish; the claws are dirty white, curved, strong and sharp, the longest one fully an inch in length. The front and sides of the head are marked by a hoary area, and this varies in extent in different specimens. In fact, the pelage of this animal varies according to age and season.

Owing to its size, three to four feet in length, to its thick-set form, short stout legs, low ears, bear-like feet, and to its markings, the wolverene has sometimes been called "skunk bear." Although the animal possesses great strength, it is, withal, a clumsy brute. As it usually carries its head and tail low, the back is given an arched appearance from the neck to the root of the tail, which latter is bushy and of some length. Its remarkably small eyes are wide apart, and its muzzle is short and pointed, while the general form of the head is very round. The ears are low, resembling those of the Pekin, and its strong jaws resemble those of some of the short-muzzled *Canidae*. A few straggling whiskers are found about the mouth, with a few more upon either side of the face. We find between the fore limbs and on the throat several spots, as in the Marten; and in some specimens these spots run together into one light-colored area. The palms and the soles of the feet are thickly furred; but the pads at the base of the toes are naked, as is also a bigger one beneath the carpus.

This sullen and greedy animal has had bestowed upon it an unusual number of names, both common and technical ones. A writer says "probably no youth's early conceptions of the Glutton were uncolored with romance; the general picture impressed upon the susceptible mind of that period being that of a ravenous monster of insatiable voracity, matchless strength, and supernatural cunning—a terror of all other beasts, the blood-thirsty master of the forest. We cannot wonder at the quality of the stream when we turn to the fountain-head of such

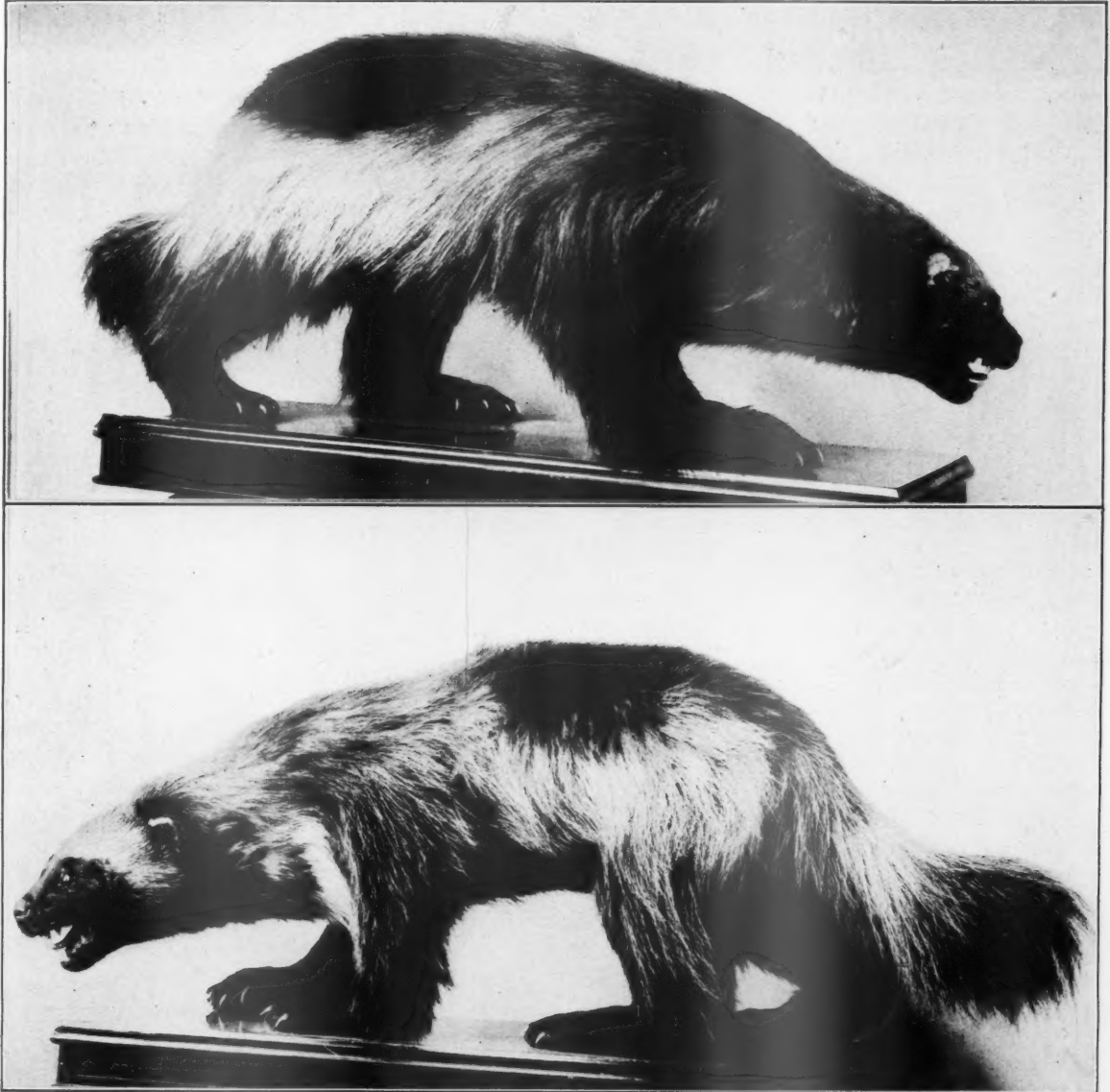


A MUSEUM SPECIMEN OF THE WOLVERENE

This fine wolverene is to be seen in one of the exhibition cases in the Mammal Hall of the United States National Museum. It was photographed by the author and appears here for the first time.

gross exaggeration. We find it gravely stated that this brute will feast upon the carcass of some large animal until its belly is swollen as tight as a drum, and then get rid of its burden by squeezing itself between two trees, in order that it may return to glut itself anew—an alleged climax of gluttony to which no four-footed beast attains. We read how the Glutton, too clumsy and tardy of foot to overtake large animals, betakes itself to the

lichens to attract its prey, and to employ the friendly services of Foxes to drive the quarry beneath the fatal spot. I allude to these things, not that such gross exaggerations longer require refutation, but because they are a part, and no inconsiderable one, of the history of the species; and because, as we shall see in the sequel, a perfectly temperate and truthful narration of the creature's actual habits sufficiently attests the possession of



TWO VIEWS OF THE WOLVERENE IN THE AMERICAN MUSEUM OF NATURAL HISTORY, NEW YORK CITY

These excellent representations are of the same mounted animal, giving the characters with great fidelity. The prints were made especially for American Forestry, and presented by the Director of the Museum.

trees beneath which they may pass, and there crouches in wait for its victim; it drops like a shot upon the unsuspecting Elk, Moose, Reindeer, and, fastening with claws and teeth, sucks the blood and destroys them as they run. That nothing may be left undone to ensure success, the animal has the wit to throw down moss or

really remarkable qualities, which may need be but caricatured for transformation into just such fables. We may remember, also, that the history of the wolverene is mixed in some cases with that of other animals, some of whose habits have been attributed to it."

Buffon, who was very much given to exaggerated ac-

counts of animals at times, could, upon other occasions and with equal facility, tell the truth. He once had opportunity to observe a captive wolverene, and his account of it is as follows: "He was so tame that he discovered no ferocity, and did not injure any person. His voracity has been as much exaggerated as his ferocity; he ate, indeed, a great deal, but when deprived of food he was not importunate. He is rather wild; avoids water, and moves with a kind of a leap. After eating he covers himself in the cage with straw; in drinking he laps like a dog. If indulged, he would devour more than four pounds of flesh in a day; he swallows his food voraciously, and almost without chewing." This was undoubtedly an Old World specimen and one, too, with an unusually good temper, which is by no means always the case.

John Watts de Peyster, of New York, writing to W. P. Dando, of London, says: "You would be astonished at the labour and expense I have lavished in gathering and reproducing information respecting these animals. I am astonished at the ferocity of your specimen, because I have read in several works that the carcajou becomes gentle and responsive to kindness, even affectionate, and learns to moderate his gluttonous appetite in captivity. Through the kindness and courtesy of different officials of the principal museums of the world, I have obtained photographs of the wolverene, or carcajou, or glutton, taken from stuffed specimens; but the photographs you kindly sent me are unique, as your institution contains the only living specimen of which I have been able to learn, in any institution in America or on the continent of Europe."

Dando says, in regard to the cage in which this animal was kept at the "Zoo," that its depth from back to front was so shallow that "unless the animal is right against the farthest wall a good photograph is impossible. I was two days getting the results shown, as the animal got into a most violent rage, foaming at the mouth at the sight of the camera, and continued his violent movements and antics for hours together every time I approached the cage, until, overcome by exhaustion, he flung himself down for a second in the position shown, rewarding me for my patience with two representative poses."

By far the best account I have been able to find of

the habits of the wolverene is by Sir John Richardson, who says: "The wolverene is a carnivorous animal, which feeds principally upon the carcasses of beasts that have been killed by accident. It has great strength and annoys the natives by destroying their hoards of provisions and demolishing their marten traps. It is so suspicious that it will rarely enter a trap itself, but, beginning behind, scatters the logs of which it is built, and then carries off the bait. It feeds also on meadow mice, marmots and other rodents, and occasionally on other disabled quadrupeds of a larger size. I have seen one chasing an American hare, which was at the same time harassed by a snowy owl. It resembles the bear in its gait and is much abroad in the winter, and the track of its journey in a single night may be traced for miles."

"The wolverenes are extremely mischievous," says another writer, "and do more damage to the fur trade

than all the other rapacious animals conjointly. They will follow the marten-hunter's path round a line of traps extending forty, fifty, or sixty miles, and render the whole unserviceable, merely to come at the baits, which are generally the head of a partridge or a bit of dried venison. They are not fond of the martens themselves, but never fail of tearing them to pieces, or of burying them in the snow by the side of the path, at a considerable distance from the trap. So pertinacious, indeed, are these animals in quest of slaughtered carcasses that they have been known to gnaw through a thick log of wood, and to dig a hole several feet in frozen ground in order to gain access to the body of



CAPTIVE WOLVERENE POSING FOR HIS PICTURE

The photograph from which this cut was made was taken by Mr. Elwin R. Sanborn, the official photographer of the New York Zoological Society, who has made so many wonderful animal photographs in the Bronx Zoological Park, New York City.

a deer concealed by hunters. Another very curious propensity of the glutton is its habit of stealing and carrying away to some distance articles which can be of no possible use to it, and an instance is recorded where these animals removed and concealed the whole paraphernalia of an unoccupied hunter's lodge, including such articles as guns, axes, knives, cooking vessels and blankets."

Experienced hunters and trappers in the West claim that a big wolverene may weigh as much as sixty pounds, but that fifty pounds is the more usual weight. They are very tenacious of life, and instances are on record where the animal has been shot through and through the chest, and not succumbed to the wound. In such cases, of course, the heart is not penetrated, and none of the large vessels divided. They nearly always travel about and

feed by night, there being from two to several individuals in the party. They have been known to be caught in a steel trap, the latter fastened to a big log, the animal dragging this for half a mile or more before being overtaken and shot.

In a good article on the Glutton is presented, dialogue fashion, the following experience of two American trappers in the forest about Chelan, Washington; I quote a part of it: "And now commenced the last act in the play, the final wind-up of the most curious and exciting, if unlucky, day's hunt that I have ever enjoyed; this was to find out the whereabouts of the trap and the animal that had made such a wreck of our carefully built pen, and we were soon back on the trap-line and commencing an examination of the scene. 'There's been a regular circus here,' observed Andy, as he looked over the dirty, plowed-up snow before us. 'However, there's one in the trap yet, and there's the direction he has gone; should you see him first, fire instantly, for the trap is only a single spring No. 1½, and he will do his best at pulling when he sees us. Look at what he's done here.'

"A clump of willows stood near, and the heavy drag-pole attached to the trap had evidently caught fast in them. But that did not seem to matter, for they were now mostly lying on the snow, mown down by the brute's teeth. The trail of the log was clearly marked, and led down a small ravine, which ran to the bottom of the canyon below, and for nearly a hundred yards we followed it. At last I saw another bunch of willows shaking violently, and there, held fast by the toes, in our steel trap, was a big wolverene, struggling desperately to detach the pole from the bush in which it had become entangled; but on our approach it stopped a moment, showed its teeth, and then recommenced its attack on the willows. For a little while I was unable to get a chance to fire, owing to its rapid movements, but one soon came, and a 255-grain hardened ball entered its head near the ear, passing out at its lower jaw, and the wolverene fell dead without so much as a single kick. I dragged the body up the hill again—no easy task, for it was four feet three inches in length, weighed all of fifty pounds, and the climbing was steep. Andy followed with the trap and pole; and, while I was engaged in taking off the thick, dark skin, he went on to see the next trap, which was half a mile distant, where he found a marten for his trouble. The wolverene's body shared the same fate as the Fisher's had earlier in the day; the pen was rebuilt, and the trap carefully set." It may be added that these men used the flayed body of the wolverene to bait the trap; and they claim that a skinned Fisher is the very best bait in the world for this purpose. During the next month they took five more of these animals, and that seemed to clear out all that was left of them in that neighborhood.

As an instance of the boldness of a Glutton when pressed by hunger, the following is presented. It happened in the middle of winter at Victoria Harbor, where the animal came over the snow wall surrounding a vessel. Notwithstanding there was over a dozen of the crew on deck, the wolverene made for a cannister of meat that

had been opened and partly used. The ravenous brute at once commenced to devour this meat; and so eager was he in doing this that one of the men had no difficulty in passing a rope slipper-noose over its head, drawing it tight and strangling it.

In those days the skin of a wolverene was held to be of considerable value in Kamchatka, and the women there used to wear in their hair, by way of ornament, the white claws of this species. It has been claimed by the older describers of this species that the pelt of the Old World specimens showed a finer and glossier coat of black hair than did the ones taken on the American continent, in which the hair more closely resembled the fur of a black bear.

In some regions, the wolverene is known as the Indian Devil, or as the North Shore Devil, and is most heartily hated by the Indian trappers, where Indians still engage in such pursuits. Great is their satisfaction when a specimen is slain or trapped, and no mercy is shown it in the latter instance.

A burrow is selected by the carcajou as its home, and here the female brings forth some half a dozen young in midsummer time. These little fellows are not so very unattractive, being lighter colored than the mother, who will, in times of danger, fight for them like a tiger; indeed, her fearlessness on such occasions is something truly remarkable. During the warmer months of the year the wolverene feeds largely upon the smaller rodents, upon certain reptiles and many insects. He is also said to kill and devour young fox cubs, running them into the parental den to capture them, the tragedy usually taking place in the innermost recesses. This insatiable prowler will also feed upon birds' eggs or on the young—indeed, he will feed on the young of anything that he can get his paws upon. It is said that if a wolverene, in the winter time, captures an animal larger than he can consume at one meal, he will bury the remainder in the snow, and then take the precaution to scent it over so thoroughly with the perfume of his own that he keeps ever on hand, that no other creature will eat it, even if on the very verge of starvation.

The wolverene does not hibernate during the winter months, and in this it agrees with other representatives of the family to which it belongs. It does not climb trees, although there are many stories afloat that this animal is a tree climber.

Nothing new seems to have been added to the life history of this remarkable animal during late years. It is, and always will be, dreaded by its enemies throughout the forests it inhabits, and by the smaller mammals it preys upon. Among our own kind it is heartily hated by any man with whose interests it interferes, and this refers especially to those who hunt and trap the fur-bearing mammals for their pelts. It has always been man's nature to hate and destroy any of the creatures below him that in any way interfere with his means of making money. He only pets and cares for those which are useful to him and contribute to his comfort, and he does not hesitate to deprive of life millions of those he subse-

quently devours. Doubtless the wolverene believes he has quite as much right to kill and eat a young fox when he comes across it, as a man has to murder a calf or a lamb in the very presence of their distracted mothers, when it strikes his fancy to want them for food. It is a very excellent example of the old saying that it is a "distinction without a difference."

The stories of the wolverene given us by Doctor Coues go to show, upon pretty good authority, that the eyesight of this animal is poor. When one of them meets with a man in the woods, it has been seen to rear up on its hind legs and to shade its eyes with one of its forepaws, much as we ourselves would do to cut off the sun's rays to get a clearer view of the person we had fallen in with. Sev-

eral of his stories illustrate the wonderful reasoning powers of the wolverene in avoiding being killed or caught by the different kinds of traps man sets. It has also been known to chew in two the string in gun-traps leading from bait to the trigger, and this not only in the case of the same trap, but two or three times, leading the hunter to believe that "that carcajou ought to live, as he must be something at least human, if not worse."

And so they go—good stories and bad; by which is meant fables about the poor, despised creature, which every other living thing knows but to abhor and hate. Still, perhaps wolverenes have, in a way, a pretty good time among themselves, when their arch enemy does not interfere with their affairs.

A LAUDABLE TREE PLANTING



THE PLANTERS OF THE ROCK ISLAND "HONOR ROW"

Underwood and Underwood.

To the Rock Island Lines goes the honor of establishing the first "Honor Row" of trees planted for employees fifty years or more in the service. This "Honor Row" has been placed along the right of way at Midlothian, Illinois, where the youngest engineer or conductor can see the Lombardy Poplar. The Rock Island Line is taking steps for the planting of memorial trees in honor of their men who were in the service of their country during the World War, but the honor roll for "Old Timers" is a very unique move.

In the picture from left to right are Charles Tinley, of Chicago, in the service since 1856; Sam N. Dickerman, of Chicago, in the service since 1867; Charles H. Davis, of Rock Island, Illinois, in the service since 1857; John F. Lacey, of Chicago, in the service since 1869; Jacob E. Binkley, of Des Moines, Iowa, in the service since 1867; E. B. Cropper, of Minneapolis, Minnesota, in the service since 1865; James Sheahan, of Chicago, in the service since 1866.

These engineers and conductors have all been retired on pension upon concluding their fiftieth year of service. The record of John F. Lacey is unparalleled in railroad history. He has traveled over ninety-five times around the world in his fifty-two years of service without an accident. The trees have been registered in the Hall of Fame by the American Forestry Association.

TOWN FORESTS - By J. W. TOUMEY

(Continued from page 96.)

older and more densely populated states of the East, the increase in the present area of public forests is likely to be in forests owned by cities and towns. I believe we can look forward to the increasing importance of these forests not only for the protection and recreational purposes that they serve, but also as important sources of local timber.

Those who have made a close study of public forest ownership abroad are convinced that communal ownership of forest property is advantageous and economically practicable. Many of those who have followed the progress of public ownership in this country also believe that communal ownership will in time prove as popular and practical as it has in Europe.

There are three reasons why city and town forests are practical and advantageous, and why it is safe to predict their inevitable rapid increase in the future.

1. City and town owned municipal water supply systems carry with them the necessity for the protection of the drainage areas from which the supply comes. This means that the only practical use to which the drainage area can be put, aside from the production of water, is for the growth of timber. Drainage areas need to be forested. Hence the necessity of city and town forests to protect municipal water supply. Even now throughout the country this is being recognized and cities and towns are buying forest property for this purpose.

2. The conspicuous increase in outlying city and town parks acquired entirely for recreational purposes in all parts of the country emphasizes the importance of adequate recreational areas for public use. These outlying parks which are now being rapidly acquired by towns and cities throughout the country, are in reality city and town forests and eventually will be managed and handled as city forests and not as parks. The idea of wood production will be emphasized as well as the ideas of recreation and protection.

3. The marked decrease in adequate supplies of timber, and the rapid advance in the prices of the better grades, make the growing of timber an economic possibility in many localities near many of our cities and towns, and this will eventually stimulate the acquiring of such land for communal forests.

If a town, by acquiring a forest property, can protect the source of its potable water, can afford space for recreational purposes, and can supply forest products for its citizens, many towns are certain to take advantage of the opportunity while near-by forest land is relatively inexpensive. Before the war, Vienna owned a great forest south of the city, stretching southward to the Austrian Alps. This forest was not only the source of the water supply for a large population, but thousands of people visited it daily for recreational purposes, not only in summer, but in winter as well. Furthermore it returned the city a large annual revenue derived from the sale of forest products.

It is my judgment that public attention should be directed by those who have it in their power to do so, to the desirability of increasing our present area of public forests in this country by literally thousands of communal forests. Towns and cities should be persuaded into purchasing such forests, and wealthy citizens encouraged into acquiring suitable forest properties and giving them as memorials to their home communities. Here is a field for the forestry associations in the several states that is almost untouched. If the forestry association in any state can, through its avenues for publicity, show the public what communal forests mean, and why the present time is auspicious for the increase of such forest ownership in this country, and can carry its influence so far that tangible results are attained, it will perform a public service infinitely beyond anything heretofore undertaken. For one, I believe in city and town forests in America. We should have many of them and widely scattered over the country. Furthermore I believe that they are practical, in the long run economical and advantageous to the community. I believe that a considerable area in communal forests well managed will be better appreciated by the public than an equal area in national forests or state forests.

Germany, before the war had but 1.8 per cent of her forest area in crown or national forests. She had about nine times as much in corporation or communal forests. Switzerland has in national and state forests combined only 4.5 per cent of her forest area, while she has 67 per cent in communal forests. In America the idea of communal forests has not been sold to the public. When it is we are certain to see a very rapid increase in this kind of public forest ownership.

In the development of communal forests it is not enough for individual towns to secure tracts of land either by gift or by purchase and call them town forests. If they do, and if there is no organized machinery for their use and development, very little is accomplished. Furthermore, an individual town owning a small area of forest land can ill afford to employ an efficient forester. This, I take it, has been the chief difficulty in the past in this country and the reason for the lack of efficient management of the limited areas of communal forests that we now have. It is my judgment that communal forestry must be closely linked up with the state forest administration and laws promulgated that will afford a form of co-operation between the community and the state which will insure to each communal forest a reasonably high order of forest management.

The wonder of the forests, their immensity and variety, their worth—are to be considered as an ineffable appeal to conserve and restore and save. Help to perpetuate—talk forestry to your friends and let AMERICAN FORESTRY MAGAZINE show them the way to a better understanding and appreciation of God's great outdoors. Nominate them for membership!

AMERICAN FORESTRY GUIDES DEPARTMENT

By SOLAN L. PARKES, CHIEF EXECUTIVE, AMERICAN FORESTRY GUIDES

From all over the country come endorsements of the organization of the American Forestry Guides, and pledges of support are being received from practically every person who has been asked to become an officer or to lend their aid to the movement. This month we publish an article by Prof. Filibert Roth, of the University of Michigan, one of the leading foresters of the country, and also comments by other prominent men on the organization.

WHY THE FORESTRY GUIDES

By Filibert Roth

BAD management has brought down the timberline here in the Alps by many miles," said the rugged old forester of Switzerland.

Modern civilization has followed this process in the human family, but instead of doing harm, is doing good.

The "Service line" has been lowered on the mountain of age; the boys and girls are sharing in the work of our people; the child's toys are laid aside for the implements of men and women; the young folks get fun out of doing men's work and women's work; they take pride in the doing; they show a superior sense of responsibility; and they actually do gain, and not lose in loveliness by this change.

The intelligent, responsible boy, and girl, rendered more courageous and enterprising by belonging to a good Voluntary Service Organization such as the American Forestry Guides, is more interesting and enjoyable to his mates and to his parents, than is the dawning youth without ideas, plans or ambitions.

The modern world moves on large lines, calls for help from many forces not formerly used, or even understood or appreciated.

The forest is off by itself; it was far more remote in the past; the average man did not visit it and certainly did not understand it, let alone love it and the man of fifty years ago does not understand it now—.

Modern education tells of Nature and the fruits of this education are beginning to appear; the young people stream to the woods, they learn of the tree and shrub, of the habitants of the forest from squirrel and hawk to fish and insect, they learn to love the woods, they learn to appreciate them as camping place and play ground, they enjoy their endless beauty, the endless source of fun.

As a consequence they resent the devastation of our forests by the greedy and ignorant, the denudation of lands which are left as unused wastes, and especially resent vandalism and the useless destruction of forests by fire.

The older generation, the men of half a century ago, did not and do not now appreciate the forest, to them it is an encumbrance, they wish to see the country "developed", the land cleared.

That this should have a proper limit did not seem to occur to them.

The warnings of Sargent in 1880 fell upon deaf ears, the greedy and interested ones were not slow to turn the old beliefs to their account in 1908 when Roosevelt and

Pinchot called the Nation's attention to our forest needs, the most powerful man in Congress was "glad that they had no forests in his good state." But this old belief and conviction has done great harm to our country and now promises to do still more.

No wonder that Solan L. Parkes, the good citizen of Reading, Pennsylvania turned away from the old, and calls upon the youth, the boys and girls of this great Nation, knowing them to be open minded and lovers of the forest; he calls to them to rescue what is left of their proper and most wonderful heritage, and to set themselves to the enormous task of rebuilding our forests throughout the length and breadth of the land.

He has tried them out in his own community. He has found them ready, able and willing, hundreds of acres have been planted to trees.

The grownups who would not come to forestry meetings, were glad to help their young people.

In 1916, 770 high school girls were transported to one of the watersheds of Reading, Pennsylvania in fifteen special trolley cars, a temporary hospital was provided; every other precaution was taken for their care and comfort. Attention was attracted to forestry needs by this effort, farmers and owners of waste lands followed the example set by the youth of Reading, until millions of trees have been planted, for the Spring of 1922; a campaign has been launched to plant an additional million. The forest planted in the Spring of 1916 was a marvelous success; it is growing with most of the trees taller than the planters, some now measuring nine feet in height.

The same held true with the forest fire loss, the older ones, the grownups seemed unable to stop forest fires. Mr. Parkes began to organize Volunteer Forest Fire Patrols as early as 1913. In 1914 the acreage burned over in Berks County amounted to 15,000 and in placing the loss at only \$3.00 the acre the County lost \$45,000 in this one year. Organization was so perfected that instead of only organizing to fight forest fires, Mr. Parkes laid greater stress on Forest Fire Prevention and this was so successful that in the Fall of 1921 less than three acres were burned over and practically no loss was occasioned.

Mr. Parkes is convinced, the girls and boys of Reading and Berks County Pennsylvania did without prating and printing, what dozens of associations of grown people did not do, what better proof could any one wish? And literally millions of young people today are waiting

for a chance to do what has so successfully been done in Pennsylvania under the leadership of Mr. Parkes. No better chance, no more worthy object, no finer inspiration, to render service than the restoration of the forests, venerable, useful and enjoyable, the teacher of the finest al-

truism; the forest of our generation and the forest which links the remote past with the distant future. This forest now calls the boys and girls of our Nation to come to its aid and stand for its preservation. Come and join the American Forestry Guide family.

WHAT PROMINENT PEOPLE SAY OF THE GUIDES

"To my mind the boys and girls who are so situated that they can get out into the woods or mountains have an opportunity for study which cannot be equaled. But for those who do not live where they can be out of doors a great deal, there are books on Nature study which can be read to advantage. ***** resources now conserved will make for a greater America when the young people of this country have grown to manhood and womanhood."

O. H. SHOUP, Governor of Colorado.

"It occurs to me that it was a happy thought more than that—an ingenious project, representing real vision—that our American boys should be enlisted in an effort to preserve to ourselves and posterity our forest wealth. 'We cannot have our cake and eat it too', we must cease our careless destruction of tree life. I foresee that a tree in the centuries of the future will be nurtured and guarded as we now take pains to preserve certain all but extinct species of animal life and rare fowls."

THOMAS C. McRAE, Governor of Arkansas.

"I am delighted to see there is a movement on foot to create a greater interest among the youth of the nation in the preservation and conservation of our forests, other trees and wild plant life, bird and harmless animal life."

BEN W. OLCOTT, Governor State of Oregon.

"Permit me to express my most thorough and hearty approval of the movement."

EDWIN P. MORROW, Governor State of Kentucky.

"The conservation of our forest trees, plants and bird life is essential to the nation and it will be a pleasure to cooperate and do what I can along these lines."

JOHN M. PARKER, Governor of State of Louisiana.

"I am in sympathy with any organized effort for forest conservation and believe that American Forestry Guides can be made of importance."

J. W. TOUMEY, Yale University.

"I am very glad to have the opportunity to serve with you in any possible way in this excellent work."

GORDON PARKER, Colorado College.

"I am very glad indeed for the privilege of working with you on the work you have in hand." (The conservation of the forests.)

F. G. MILLER, University of Idaho.

"Pleased and honored to be identified with the American Forestry Guides."

THOMAS B. WYMAN, Wyman's School of the Woods.

"Glad to assist in any way I can."

HUGO WINKENWERDER, University of Washington.

"I consider this new and important field of work very vital to the whole plan of furthering forest conservation."

R. P. McLAUGHLIN, Montana State Forester.

"I will be very glad to be of what assistance I can in the efforts to educate the younger generation of today to the present needs of forest conservation."

THOMAS D. BURLEIGH, University of Georgia.

"Perhaps our greatest need just at the present time is to arouse public interest in fire protection and to secure the cooperation of everyone going into the woods to prevent fires from starting. If your organization can be of assistance in this direction, both through general publicity and through the personal education of individuals of all ages, it will be performing a real service."

S. T. DANA, Forest Commissioner of Maine.

QUESTION BOX

J. D., Wis.—Certainly you can become a member of the American Forestry Guides, you can keep your membership in the organization you mention.

We will explain further: The American Forestry Guides plan was especially originated to give to the boys and girls, to the young men and to young women a forestry program, whereby all could understand that all plant and animal life was placed here for a purpose and that by its wanton destruction we are showing not only great ignorance but also a great disregard for the benefits derived from our resources.

So no matter what other organization you belong to you can be an American Forestry Guide.

You also say that you "want to get all out of life that you can." Do so, but do not forget that you must also make your life count, for you also like the trees were placed here for a purpose and that purpose was not alone to see what you can get out of life, but also to make your life useful to others and to your country.

R. H., Colo.—You can select the name of any great American for the name of your Post.

R. O., Ind.—Write to your State Forester, he will help you.

S. T. N., Mexico.—Write to Wm. B. Greeley, Chief of the U. S. Forest Service for Hand Book for Campers in the National Forests of California. On pages 34 and 35 you will find illustrated the method used to tie your equipment on your pack horse, read article on First Aid on page 37 also. This pamphlet is all sufficient for any one that will travel on horseback.

N. K., Minn.—Pennsylvania was the first state to establish a Forestry Department, as a regular branch of the State government. J. T. Rothrock was the first Forestry Commissioner. At the present time Gifford Pinchot fills the position.

O. M., Wis.—Tennessee is the first State to pass a law making the study of forestry compulsory. Write to the State Forester at Nashville, Tennessee, if you care to have a copy.

Miss J. V., Colo.—You ask if there are opportunities for a girl in the forestry field. This we answer in this manner. Louisiana has employed a lady forester who is devoting all her time to the work. This is the first one so employed that we have knowledge of, and is a wonderful step forward in the right direction for while man has spent his life to cut down trees, this lady forester spends her life teaching the youth of her state how to plant forests; that there is value in plant life and should not be destroyed; that while the birds add life and beauty to our natural scenery and fill the air with song that they also are one of the greatest friends of men, by feeding and living on the insects that would destroy our crops. Write to her for advice.

Address your letter, Miss C. C. Dormon, Department of Conservation, New Orleans, Louisiana, Care V. H. Sonderegger, Superintendent.

H. T., Penna.—You will find the Bird House survey by Ned Dearborn, a safe guide. While it is true that wrens do build in houses that have entrances of larger diameter, you will find that other birds cannot enter the wren houses. The wren does not like to be disturbed and is likely to seek another home if molested too often, hence the smaller entrance is the more advisable.

H. T., Miss.—Yes, you can organize your Post in two divisions, one where the ages run from 9 to 14 years and the other from 14 to 20. Your idea of having the Post of the younger boys meet after school is excellent.

Space will not permit us to answer all your letters. This will be taken care of later on.

CANADIAN DEPARTMENT

By ELLWOOD WILSON

During the summer the Premier of Ontario planned to appoint a forester as Deputy Minister of Lands and Forests, and to bring the management of the Province's timber lands to an up-to-date and efficient basis. He planned to improve fire protection, to establish county forests, and many other improvements. The appointment of Mr. Cain, Secretary to the present Minister, has just been announced. It is sincerely hoped that this appointment will not mean that the old policy will be retained. The new Deputy Minister has an enormous opportunity if he will but have the courage to forget politics and try and administer the forests for the good of the people. All strength to his arm.

The two peripatetic cars of the Canadian Forestry Association have been combined and are now touring the Eastern Provinces. From November 14 to 19, nearly 3,500 people visited these cars to see the exhibits and to hear the lectures in French and English. A great many school children came and it is safe to say went away knowing a great deal more about the forests. The basic demand for forestry progress is popular education along popular lines, and the travelling cars are doing a splendid work.

A Johnson gasoline fire pump was last spring sent over to Scotland for use on a large estate on which a serious forest fire had occurred the previous year. This season was an exceptionally dry one, and the pump helped very materially in extinguishing two fires.

The inaugural meeting of the Empire Forestry Association was held in the Council Chamber of the Guildhall in London on the sixteenth of November. The Lord Mayor presided. This association has been granted a Royal Charter, and has for its patron the King, and for its first president the Prince of Wales. The object of the association is to spread information as to forestry, to bring about closer relations and co-operation between the forestry agencies throughout the empire and try and encourage the interchange of timber products among the Dominions and Colonies. It will endeavor to educate public opinion to demand the adoption of rational forest policies and will try to serve as a link between associations and individuals who are interested in forestry. It will also collect and publish facts as to existing forest conditions throughout the empire and its future timber requirements. It will publish a quarterly magazine.

Mr. Helge Sylven, writing from Sweden, voices the need for an international society of forest engineers. An attempt was made

to do this about 1912, but only two members were obtained, one in Spain and one in Canada. Dr. Unwin has tried to get a Society for British Foresters started also. It would seem, however, that an international society would be better. Foresters' problems are the same the world over and great good would come from a closer relationship and exchange of ideas. The present close relations between Swedish and Canadian, and between Indian and United States foresters have certainly shown how useful some such society could be.

Forestry in Australia has met a very bad blow by the resignation of Mr. C. E. Lane-Poole. Large vested interests asked for large timber cutting rights which were decidedly contrary to good forest policy. In order to prevent this from going through until the matter could be discussed openly in Parliament, Mr. Lane-Poole asked to be released. Another instance of the forester sacrificing himself for the good of his country. Mr. Lane-Poole will make a report on the forests of Papua.

The past season has been the worst ever experienced in the St. Maurice Valley. For seven weeks in the spring no rain fell, and in the western section July and September were also very dry. Many men were out of work, so that the woods were full of hunters and fishermen, and as many of the farmers who usually work on the drives and in the woods could get nothing to do, they turned their attention to clearing more land on their farms, so that the number of settlers' fires was larger than for many years. The cost of extinguishing fires reached a figure never before heard of, \$114,180 having been spent as against \$13,004 spent in 1914. The number of fires along railway lines was much reduced, owing to the awakening of railway officials to the seriousness of destroying timberlands by fires, and their much-increased interest in seeing that they set as few fires as possible. From managers to sectionmen they did their best and have demonstrated that railway fires can be controlled. Railway fires were reduced from 149 for 1920, to 52 for 1921. In all 216 fires were reported, 82 less than the previous season, and of these 79 required extra labour. The total loss this year is greater than the total of the nine previous years, 193,791 acres were burnt over, 17 per cent of which was merchantable timber. There is a strong presumption that some fires were set to obtain work and some were kept burning for the same purpose. Nineteen prosecutions were brought against men who refused to fight fires and six against settlers for setting fire to their clearings without permits. Settlers caused more fire than they did in the last

five years. Most of the large fires were caused by hunters and fishermen in inaccessible places. Seven fires burned over an area of more than 10,000 acres each, and five between 5,000 and 10,000 acres. One fire was so severe that one of the mills closed down and all the available men went to fight the fire. On some fires men were kept busy for over two months. A vigorous campaign of education was carried on during the last year, a man with a moving picture machine visited villages and drivers camps, and much interest was excited. The only hope is in educating the people who use the woods to be careful. It seems that the only way to enforce carefulness on those travelling in the woods will be to require all who go into the woods to obtain a permit from the district ranger, simply to keep track of them. If men know that their presence in the woods is recorded, it will make them much more careful.

The lesson of the season is that when bad dry summers occur in country which must be traversed almost entirely by canoe, and where there are no means of quickly reporting fires, the system of ground patrol breaks down entirely. Rangers travelling along the water routes cannot see smoke behind the hills until the fire is beyond their control and then it takes so long to travel to a telephone and get back with help that the fire has become a conflagration. During the last season a number of fires were picked out and reported by seaplanes on other duty, which had not been seen at all by the rangers and which had been burning for some time. In a country so covered with lakes and rivers as the St. Maurice Valley, a daily aeroplane patrol would be better than even an intensive ground patrol and the crew of the plane could easily land and extinguish fires long before they had time to assume any size at all. This method may be given a thorough tryout next season.

A new flying boat has just been constructed which can climb easily to 19,000 feet, as against 8,000 for previous models, and which can cruise for six hours at speeds from 60 to 130 miles per hour. It has climbed 15,000 feet in 39 minutes. It has a low landing speed and would seem to be an ideal machine for forest patrol and mapping.

It is hoped that before long the Provinces of Canada will announce definite forest policies which will safeguard the forests so that our important wood using industries will be assured of a continual supply of raw material. Two of the Provinces, British Columbia and New Brunswick, have appointed advisory committees of lumber-

(Continued on page 120.)



Reproduction from a painting in oil by Frank Swift Chase, of the beautiful John B. Stetson estate near Philadelphia.

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An investment in a home probably may depreciate thousands of dollars if certain priceless trees are later lost. Whether you own the place or consider buying it, the thing of first importance is the trees. Before you buy, make sure what their condition is—how much attention they require; whether any of those needing attention are beyond saving. An examination and report, by tree authorities of absolute reliability, costs very little. Before you plan your home have your trees examined by Davey Tree Surgeons. Do not make the mistake of locating your house—or planning the landscape—with reference to certain trees unless you are sure they can be saved. This very mistake has been made thousands of times.

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BOY SCOUTS AND THEIR FRIENDS THE TREES

By E. S. Martin

From the beginning Scouting has taken boys from city streets out into the woods and aimed to develop an interest in all out door life. The trees, especially, are a Boy Scout's good friends. He is taught to exercise the greatest care in extinguishing his camp fires so as to run no risk of starting a forest fire and otherwise to refrain from doing anything which might in any way injure forest life. But Scouting goes farther than this. It actively employs its members as conservationists.

All over the country Boy Scouts are being enrolled as aides to Forestry and Park Commissioners in preventing and fighting forest fires, waging war upon the bag worm, the gypsy moth and other tree enemies, helping enlist popular interest in conservation methods and forest protection generally. In the state of Pennsylvania alone it is estimated that thousands of acres of valuable timber land have been saved by the efforts of Scouts.

In Marion, Indiana, Pontiac, Michigan, Jackson, Mississippi, Terra Haute, Indiana, Riverside, California, and many other



THE NIGHTMARE
The Revenge of the Trees

cities Scouts have made city wide surveys, locating and tabulating species and condition of trees, in co-operation with City Planing Commissions and other agencies.

During the war the Boy Scouts of America located for government use large quantities of standing black walnut timber and promised to do their utmost to see that any depletion of the species was supplied by re-planting. This pledge lead to Scouts undertaking an extensive service in the planting of trees of many species, which has been going on ever since. In city after city they have taken the lead or worked with others in planting "memorial trees" in honor of the soldier dead, over 20,000 such trees being planted by them during the past two years.

Every tree is a matter of interest to a Boy Scout, a friend to be studied and revered and protected to the utmost of his power and every Scout believes that.

"He that planteth a tree is a servant of God."

PLEASANT THINGS TAKEN FROM LETTERS TO THE EDITOR

"Your valued magazine is much appreciated and I hope will be a power for conservation of our forests."

ALFRED W. GIBBS.

"I am sure the bulletins which you sent will be of very great assistance to us in preparing our outline of work to be used in connection with our public schools."

E. N. COLLETTE.

"Usually, especially these days, one cannot send remittances in various directions without letting them go with considerable reluctance, but there is one remittance that I make and that I am glad to make, one in which I take genuine pleasure, and that is for the American Forestry Association, only regretting that I could not make it a hundred times as large and thus do more to help along the work."

D. M. RIORDAN.

"I am a student in the New York State College of Forestry at Syracuse, N. Y., and find many articles in AMERICAN FORESTRY which are of value to me in my studies. I cannot praise too highly the work which your paper and your Association is doing."

JOHN G. CAULKINS.

"Your magazine gets better every issue."

B. H. STONE.

"I am herewith enclosing check to cover dues for my subscription to your magazine for the coming year, and wish to state that I thoroughly enjoy every issue and am glad to cooperate by sending dues promptly."

CARRIE L. ENGAU.

"I wish you success in your work."

JOHN A. DOELLE.

"The magazine is very good and I intend to write you about its merits some time in the near future."

A. E. WATERS.

"The magazine is a delight to peruse and you deserve the thanks of every nature lover for giving us such a publication."

H. B. DECKER.

"I do not know what we would have done without AMERICAN FORESTRY. It has enabled us to emphasize the advantages gained to a country by a proper forestry organization."

V. B. TRAPPE (Australia).

"I would not forfeit my membership for a good deal. With best wishes for the welfare of the Association."

P. D. HANSON.

"I have been taking the AMERICAN FORESTRY magazine for several years and it is very interesting and instructive."

HARRY E. DOBBINS.

"The June issue of AMERICAN FORESTRY is perhaps the most attractive issue of that publication we have ever seen and Supervisor McCain's beautifully illustrated article on 'The Lofty Tetons' is surely one of the best features of the issue."—Daily News Bulletin of the Intermountain District of the Forest Service.

"I see great improvement in the magazine during the last few months over the same magazine a year ago and sincerely hope to see it advance rapidly in the months to come."

E. L. SCOVELL.

"We attach much importance to teaching our boys and girls about forestry, and your magazine is wonderful."

MISS KATHERINE PETTIT.

"I think AMERICAN FORESTRY magazine is improving each issue, and can hardly see how any one interested in forestry or the welfare of the land can do without it."

D. W. BABCOCK.

I have enjoyed reading AMERICAN FORESTRY during the past year and regard it as possessing unusual merits."

J. L. CARTER.

MINING AND FORESTRY IN ILLINOIS

The interdependence of forestry and many of the industries becomes more apparent day by day. Coal mining companies in southern Illinois are becoming interested in the value of their own timberlands as the prices of mine timbers increase, State Forester R. B. Miller of Urbana reports.

The first step in this direction was made in March, 1909, when a company in Williamson county had the United States Forest Service make an examination and planting plan for their lands, an area of 14,000 acres. Two courses were suggested to them by the service, first gradually to restore the soil to its former state of fertility by up-to-date methods of agriculture or to try out thoroughly, the practicability of forest planting on something like 140 acres.

Within the last year State Forester Miller has made examinations of timberland owned by two large coal companies in southern Illinois and found that in each case the main question was one of fire protection. One of the companies also had an eastern forester go over the same ground and his opinion and recommendations were practically the same. He further stated as

an impartial observer from another state, that intensive forestry had great possibilities in southern Illinois due to the rapid growth of the species, the favorable market and the chance to sell profitably the product from cleanings and thinnings—operations which would also benefit the stand of timber.

This company is taking the advice of the foresters and already has put a patrolman and watchman on their land in Franklin county to look out for fires and also plans a detailed survey and examination of their timber holdings.

"With the present high price of mine timbers," State Forester Miller said, "the logical and economic thing would seem to be for the coal companies to have a nearby supply of timber on their own lands at least to protect it from fire so that they will have a reserve in the future when the supply from farm woodlands is exhausted.

"On account of high freight rates, a man who is in the business of buying mine timber reports that his freight is almost as much as the cost of the timber, so the plea that the mines can get Missouri timber when our own supply is exhausted is based on a fallacy. This extra cost for timber due to high freight rates must be passed on to the consumer, as an increased cost of coal."

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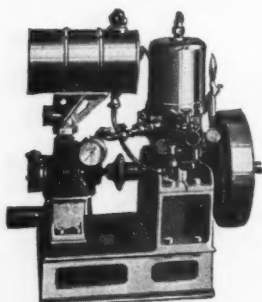
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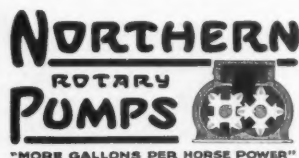
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CANADIAN DEPARTMENT--Continued

(Continued from page 116.)

men and pulp and paper men, who constitute a minority on the board and have a vote as to the policy of the Government. Ontario and Quebec are going to be asked to appoint similar committees.

Mr. G. C. Piche, Chief Forester of Quebec, has just announced in the "Canada Lumberman" that his Government will "in the near future fix a maximum quantity of cutting to be done per acre." He has explained this to mean that if a licensee has, say, 10,000 acres, he will be allowed to cut each year on the whole tract, say, sixty-five board feet per acre, the approximate average annual increment, or 650,000 board feet per year on the whole tract. This would be somewhat less than three logs per acre. There is no question but that some such restriction is necessary to keep the forests productive, but just how it works out in practice remains to be seen. At present the Government has not enough men on its staff to supervise such work. It could be easily controlled, however, by some penalty on those who cut a greater number of logs over their total holdings than that specified by the regulation. However, this would not prevent over-cutting on one section and no cutting on another, which would result in getting everything off the land which the diameter regulations would allow. It will be of great interest to see how the Government will work out this scheme.

During the week of December 19 the organization meeting of the Quebec Society of Forest Engineers was held in the City of Quebec. Legislation has been passed making forest engineers a "closed corporation," that is, no person can practice as a forester in the Province of Quebec unless he is a member of this association. Should a non-member call himself a forest engineer or practice, he is subject to a fine, and in default of payment, to imprisonment. The

QUARANTINE AREA CHANGED

Ten towns in New Hampshire, Massachusetts, and Rhode Island are transferred from lightly infested gipsy moth area to the generally infested gipsy moth area according to regulations supplemental to a notice of quarantine No. 45 on account of the Gipsy Moth and Brown-Tail Moth. The amendment became effective January 1, 1922 according to an announcement made by the Federal Horticultural Board of the United States Department of Agriculture. This transfer is based on actual condition of infestation and will simplify the enforcement of the quarantine by lessening the inspection and certification. The towns included are Fitzwilliam, N. H.; Royalston, Athol, Phillipston, Templeton, Hubbardston, Rutland, Paxton, and Leicester, Massachusetts and Narragansett, Rhode Island.

fees chargeable to the public are also fixed and foresters can sue for them in the courts. This puts the profession of forestry on an equal footing with that of civil engineers, land surveyors, physicians and lawyers. The association commences its career with a membership of 75. The requirements for associate membership are 21 years of age, must be a British subject and a graduate of the forest school of Laval University, or the Montreal Technical School, or a university of recognized standing in the Province of Quebec. All graduates of other forest schools must appear before the Board of Examiners, and if their credentials are satisfactory they may be permitted to practice. In order to obtain full membership, a man must have been a member of this society for 3 years and have been in active practice. A committee was appointed to draw up a practice for making valuation surveys, for working plans and for requests for the reduction of the diameter limit, to be presented to the Government. This society will undoubtedly do much to bring together the foresters in the Province and to raise the standard of work. A meeting of all the foresters working for private corporations was also held and matters of mutual interest discussed. The men present decided to meet informally at least four times a year, to discuss the problems which confront them as foresters for large pulp and paper companies, and much valuable information was exchanged.

The final report of the Canadian Air Board for this year has just been issued and shows remarkable achievement in the application of flying to forestry work and fire protection during the past season. In this connection the Keewatin Lumber Company has borrowed from the Air Board a dirigible balloon 143 feet long, 75 H. P., and hope to try this out in their forestry work next year.

STATES' APPROPRIATIONS FOR FORESTRY

Reflecting the growing public interest in timber production and the need for forest protection and reforestation throughout the country, State appropriations for forestry show an increase of 78 per cent over those of 1919, according to figures compiled by the Forest Service, United States Department of Agriculture. The total appropriation by 32 State legislatures for 1921 amounted to \$4,065,434. New York leads, with over \$1,000,000, and Pennsylvania holds second place, with \$860,000. The greatest percentage of increase is shown in California, where the forestry appropriation of \$45,800 for 1919 was raised to \$398,800 for 1921, or 771 per cent. Kentucky, Minnesota, and West Virginia alone show decreased appropriations.

BOOK REVIEWS

THE DRAMA OF THE FORESTS—By Arthur Heming. Doubleday Page, \$5.00.

A splendidly written, inspiring story of the wilds of Northern Canada. Fascinating, entertaining and filled with real facts about real people. One reviewer says of it: "The picturesque life of the Northern forests is departing—the glory and romance of the old Hudson's Bay Factors have passed their zenith. But Arthur Heming has caught it—and held it—and passed it on to you." The book is beautifully illustrated with reproductions in color of paintings owned by the Royal Ontario Museum.

CITY HOMES ON COUNTRY LANES.

By William E. Smythe. (Macmillan). \$2.50.

Designated as the "philosophy and practice of the Home-in-a-Garden" this volume is the first of three books designed to deal with one general theme. Together, they will present a practical program for the making of what, in a spiritual sense at least may well be characterized as the New Earth—which, of course, could be nothing but new ways of using the Old Earth, to the end that it may in time produce a great new crop of homes and institutions. The plan calls for "garden cities," for the millions who are city-bound but who hunger for a touch of the open spaces; for "little-landings" or the science of most intensive cultivation and use of the individual small holding, and for "rural settlements"—forty acres and upward—developed in accordance with the highest modern ideals, as already in practical application, and this volume covers the first phase of the program.

LUMBER SALESMANSHIP

The New York State College of Forestry at Syracuse University believing that more efficient and complete utilization of the products of our American forests is practicing as good forestry as replanting cut-over areas, leaving seed trees to reforest areas that are being lumbered, protection from forest fires, etc., and that lumber salesmanship is a phase of lumbering seriously needed by this great American industry, recently offered such a course to students specializing in lumbering and wood utilization. This is the first course of its kind in American forestry schools.

BOOKS ON FORESTRY

AMERICAN FORESTRY will publish each month, for the benefit of those who wish books on forestry, a list of titles, authors and prices of such books. These may be ordered through the American Forestry Association, Washington, D. C. Prices are by mail or express prepaid.

FOREST VALUATION—Filibert Roth.....	\$1.50
FOREST REGULATION—Filibert Roth.....	2.00
PRACTICAL TREE REPAIR—By Elbert Peets.....	2.35
LUMBER MANUFACTURING ACCOUNTS—By Arthur F. Jones.....	2.10
FOREST VALUATION—By E. H. Chapman.....	3.10
CHEMISTRY OF PULP AND PAPER MAKING—By Edwin Sutermeister.....	6.10
CHINESE FOREST TREES AND TIMBER SUPPLY—By Norman Shaw.....	2.50
TREES, SHRUBS, VINES AND HERBACEOUS PERENNIALS—By John Kirkgaard.....	1.50
TREES AND SHRUBS—By Charles Sprague Sargent—Vols. I and II, 4 Parts to a Volume—Per Part.....	5.00
THE TRAINING OF A FORESTER—Gifford Pinchot.....	1.35
LUMBER AND ITS USES—R. S. Kellogg.....	2.15
FORESTS, WOODS AND TREES IN RELATION TO HYGIENE—By Augustine Henry.....	5.25
DEVELOPMENT OF FOREST LAW IN AMERICA—By J. P. Kinney.....	2.60
STUDIES IN FRENCH FORESTRY—By Theodore S. Woolsey.....	6.10
FOREST PHYSIOGRAPHY—By Isaiah Bowman.....	5.10
KEY TO THE TREES—Collins and Preston.....	1.50
THE FARM WOODLOT—E. G. Cheyney and J. P. Wentling.....	1.75
IDENTIFICATION OF THE ECONOMIC WOODS OF THE UNITED STATES—Samuel J. Record.....	2.60
PLANE SURVEYING—John C. Tracy.....	3.60
FOREST MENSURATION—Herman Haupt Chapman.....	5.00
FOREST PRODUCTS, THEIR MANUFACTURE AND USE—By Nelson Courtland Brown.....	4.15
FIRST BOOK OF FORESTRY—Filibert Roth.....	1.10
PRACTICAL FORESTRY—A. S. Fuller.....	1.50
PRINCIPLES OF AMERICAN FORESTRY—Samuel B. Green.....	2.00
TREES IN WINTER—A. S. Blakeslee and C. D. Jarvis.....	2.50
AMERICAN WOODS—Romeyn B. Hough, 14 Volumes, per Volume.....	10.00
Hand Morocco Binding.....	
HANDBOOK OF THE TREES OF THE NORTHERN U. S. AND CANADA, EAST OF THE ROCKY MOUNTAINS—Romeyn B. Hough.....	8.00
Half Morocco Binding.....	10.00
GETTING ACQUAINTED WITH THE TREES—J. Horace McFarland.....	1.75
HANDBOOK OF TIMBER PRESERVATION—Samuel M. Rowe.....	5.00
TREES OF NEW ENGLAND—L. L. Dame and Henry Brooks.....	1.50
OUR TREES, HOW TO KNOW THEM—By Clarence H. Weed.....	3.50
TREES, SHRUBS AND VINES OF THE NORTHEASTERN UNITED STATES—H. E. Parkhurst.....	1.50
TREES—H. Marshall Ward.....	1.50
OUR NATIONAL PARKS—John Muir.....	1.91
PRACTICAL FORESTRY—John Gifford.....	2.50
MANUAL OF THE TREES OF NORTH AMERICA—By Charles Sprague Sargent.....	12.50
THE IMPORTANT TIMBER TREES OF THE UNITED STATES—S. B. Elliott.....	2.50
MANUAL OF FORESTRY—VOL. I—Ralph C. Hawley and Austin F. Hawes.....	3.60
THE PRINCIPLES OF HANDLING WOODLANDS—Henry Solon Graves.....	2.60
SHADE TREES IN TOWNS AND CITIES—William Solotaroff.....	3.60
THE TREE GUIDE—By Julia Ellen Rogers.....	1.00
MANUAL FOR NORTHERN WOODSMEN—Austin Cary.....	2.12
THE THEORY AND PRACTICE OF WORKING PLANS (in forest organization)—A. B. Recknagel.....	2.50
ELEMENTS OF FORESTRY—F. F. Moon and N. C. Brown.....	3.60
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STUDIES OF TREES—J. J. Levison.....	2.10
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THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.00
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FIELD BOOK OF AMERICAN TREES AND SHRUBS—F. Schuyler Mathews.....	2.00
FIELD BOOK OF WILD BIRDS AND THEIR MUSIC—By F. Schuyler Mathews.....	2.00
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THE BOOK OF FORESTRY—By Frederick F. Moon.....	2.10
OUR FIELD AND FOREST TREES—By Maud Going.....	1.50
HANDBOOK FOR RANGERS AND WOODSMEN—By Jay L. B. Taylor.....	3.10
THE LAND WE LIVE IN—By Overton Price.....	1.70
WOOD AND FOREST—By William Rogers.....	3.00
THE ESSENTIALS OF AMERICAN TIMBER LAW—By J. F. Kinney.....	3.00
HANDBOOK OF CLEARING AND GRUBBING, METHODS AND COST—By Halbert P. Gillette.....	1.60
FRENCH FORESTS AND FORESTRY—By Theodore S. Woolsey, Jr.....	3.10
WOOD AND OTHER ORGANIC STRUCTURAL MATERIALS—Chas. H. Snow.....	5.00
EXERCISES IN FOREST MENSURATION—Winkenwerder and Clark.....	1.50
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MANUAL OF TREE DISEASES—Howard Rankin.....	2.50
THE BOOK OF THE NATIONAL PARKS—By Robert Sterling Yard.....	3.10
THE STORY OF THE FOREST—By J. Gordon Dorrance.....	.45
FOREST MANAGEMENT—By A. B. Recknagel and John Bentley, Jr.....	2.60
THE FOREST RANGER AND OTHER VERSE—By John Guthrie.....	1.60
TIMBER, ITS STRENGTH, SEASONING AND GRADING—By H. S. Betts.....	3.10
THE HISTORIC TREES OF MASSACHUSETTS—By J. R. Simmons.....	3.65
TIMBERS—AND THEIR USES—By Wrena Winn.....	5.15
THE PRESERVATION OF STRUCTURAL TIMBER—Howard F. Weiss.....	3.50
THE UNITED STATES FOREST POLICY—By John Lee.....	5.15
THE KILN DRYING OF LUMBER—By Harry D. Tiemann.....	4.65
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THE PRACTICE OF SILVICULTURE—By Ralph C. Hawley.....	4.10
WOOD PRODUCTS—W. Dumesny.....	6.50
GUIDE TO THE TREES—A. Lousberry.....	3.00
THE TREE BOOK—Julia Ellen Rogers.....	6.00

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Mr. C. E. Strawbridge, of Lima, Ohio, writes us under date of August 26, 1920, as follows: "On April 10, 1916, I set out one of your new Rochester Peach trees. Last year we picked 5 peaches from it, each averaging the size of an average tea cup. **THIS YEAR WE HAVE PICKED EXACTLY 403 LARGE PEACHES FROM THIS ONE TREE.** Many people have seen this tree, and can hardly believe their own eyes. One of its admirers was Postmaster J. E. Sullivan, who wants me to put him in touch with the 'PEACHES WHO HAVE SUCH TREES FOR SALE'."

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Mr. C. M. Thomas, 215 W. 40th St., Savannah, Ga., purchased a Rochester Peach from us last February, and picked the first fruit in July.

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HARDY AVOCADO DISCOVERED IN ECUADOR.

A variety of avocado, or alligator pear, the fruit of which attains a weight of 18 ounces and the trees of which will stand some frost, has been sent to the office of foreign seed and plant introduction, United States Department of Agriculture, by Wilson Popenoe, plant explorer in South America, and buds of it are now growing in the department greenhouses. Curiously, the new avocado, hardier against cold than the ordinary West Indian and Guatemalan varieties, was discovered in Ecuador, a country situated on the Equator. The region, hitherto unknown as producing this fruit, is in what is known as the Chota Valley, 6,000 feet above sea level, giving a climate comparable to many regions much farther north. Most of the fruits of varieties of this Mexican race are small. This one has fruits comparable in size with those of the more tender races. Regions occasionally visited by a temperature of plus 18 degrees F. have produced bearing trees of the Mexican avocado.

FOURTH SOUTHERN FORESTRY CONGRESS

With February 6, 7, and 8 definitely set as the dates for the Fourth Southern Forestry Congress, President Roy L. Hogue of the Congress announces that plans are progressing for the meeting at Jackson. The Mississippi Legislature will be in session at that time, and the foresters are confident that favorable action will be taken in forestry matters. A comprehensive forestry bill will be introduced in to the Legislature at the recommendation of the Reclamation Commission which was created by the last Legislature. P. P. Garner, Commissioner of Agriculture, is president of the Commission, and J. T. Ward of Waynesboro, who is also a lumberman and member of the House of Representatives, is secretary. The Commission has delved deep into the question of forestry in Mississippi, and their recommendations will carry much weight.

"We feel that the convening of the Fourth Congress at Jackson while the forestry bill is under consideration will go far towards focusing public attention on this topic", says Mr. Hogue. "While the Southern Forestry Congress as an organization is not committed to any specific bill, we are always eager to further the passage of any forestry legislation which has local support. In other words, we do not aim to 'mix' in any way with local politics, but aim to bring to each State an account of what the other States of the South are doing along forestry lines. In this way we can render the most effective assistance in arousing enthusiasm for forestry."

The program of the Congress as tentatively arranged includes a number of subjects of first interest to the lumber industry. Among these are the knotty problems of the taxation of forest lands, which was the center of a large part of the discussion at New Orleans on November 14 and 15, when the Forestry Policy Committee of the National Chamber of Commerce called on the Southern lumbermen and conservationists to express their views on forestry. Every effort will be made to secure the attendance of the Tax Commissioners from Southern States, many of whom are alive to the burdens under which the lumberman or land-owner labors when he undertakes to practice conservative lumbering or outright reforestation. Other topics of particular interest to the lumbermen will be national forestry policies, and minimum silvicultural requirements for the South. The latter is the technical title for the study which is being made by the Southern Forest Experiment Station and Austin Cary of the Forest Service of the measures which are necessary to keep forest lands reasonably productive of timber. The topic covers the question of seed trees, slash disposal, and fire protection, as ap-

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plied to all types of forest, including the hardwood lands and cypress brakes. Other subjects to be discussed at the meeting include forestry in the public schools, the forests and our navigable streams, and forest fires. The list of speakers will be announced at a later date.

WOOD LOT NEEDED ON FARMS

Iowa farmers use between \$6,000,000 and \$10,000,000 worth of lumber annually, according to the forestry department at Iowa State College, and this bill will soon be doubled, unless they economize in the use of the better grades and give attention to the treatment of forest products. The farmer is the largest user of wood in the United States, say the forestry experts, who estimate that 46 per cent of all wood used annually goes to the farms. Not only does the farm require much timber and wood for posts, fuel and minor supplies but the average farm each year uses 2,000 board feet of lumber for buildings.

Better grades of building lumber, such as pine, cypress and oak, according to I. T. Bode, extension service forester, are getting scarcer every day, but in spite of this there is a greater demand than ever for lumber and posts on the farm. Building and repair work on the average farm are at present below normal but there will soon be a greater call for lumber.

To meet this demand Mr. Bode advocates the farm woodlot. Every farm should have a planting of trees of different varieties and this should be placed on waste land that will not produce a good agricultural crop. By the planting of rapid growing softwood trees, serviceable lumber will result in ten years time and these woods can be treated with creosote or other preservative and last as long as the better grades of hardwoods.

In order to start this work in Iowa the extension service has established a forestry department which will endeavor to increase the use of softwood fence posts by treatment; establish more woodlots in Iowa and have them managed in a definite manner and placed on the wasted corners and poorer land of the farms; and to provide permanent farm protection by establishing shelterbelts for animals and buildings that will return wood for farm uses.

OF INTEREST TO USERS OF WOOD WASTE

The Wood Waste Exchange of the U. S. Forest Service has been transferred from Washington to the Forest Products Laboratory, Madison, Wisconsin, where its future activities will be centered. The Exchange has in the past contributed much towards more complete utilization of wood, by supplying a medium through which the mills and wood-using factories could locate markets for their side lumber and short lengths, and wood-consuming factories sources of material of this character which would meet their requirements.

Centering the activities of the Exchange at the Forest Products Laboratory will permit an expansion of this service, in that it will be possible to include suggestions as to markets and new uses for by-products and low grade material, based on the latest results of technical research carried on by the Laboratory.

All communications should be addressed to the director, Forest Products Laboratory, Madison, Wisconsin.

YELLOWSTONE OUR GREAT FISHING PRESERVE

In order to insure the reputation of the Yellowstone National Park as the greatest fishing preserve in the United States the National Park Service in cooperation with the United States bureau of Fisheries carried on the restocking of the Lakes and streams of the Yellowstone this past season on a greater scale than ever before. The Government fish hatchery was maintained on Yellowstone Lake during the season with excellent results. The total collection of eggs of native trout in the park was 5,996,000 which were developed to the stage of eyed eggs and fry and 2,871,000 of these were returned to the waters of the park and the balance, except, of course, the ordinary losses incident to hatching and transportation, were distributed to points outside the park. In addition to those collected in the park, there were distributed in park waters from outside hatcheries 2,800,000 fry or a total of 4,051,000 fish. This is double the amount of fish planted in 1920. The species were Eastern brook,

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The theory advanced by some to the effect that Yellowstone Lake, the largest lake at an altitude of 7,700 feet in the world, contained insufficient food for the large numbers of native trout which are found in its waters is not sustained by Professor Richard R. Muttkowski of the University of Idaho, who studied the question of available food supply for fish in park waters.

With greater and more scientific restocking of park waters each year, the Yellowstone is truly the fisherman's paradise.

CALIFORNIA'S NEW STATE FORESTER

M. B. Pratt has been appointed by Gov. William D. Stephens of California to the position of state forester, to succeed G. M. Homans, who died on November 20th.

Mr. Pratt, who is a native of Paw Paw, Illinois, was graduated from the University of Chicago in 1903 and from the Yale Forest School in 1905, then entering the United States Forest Service as forest assistant, being assigned to California. Following the first year of his work on general investigation he was assigned to the Tahoe National Forest, where he remained for



M. B. PRATT

about eight years, being promoted to deputy forest supervisor.

In 1914 he was appointed assistant professor of forestry at the University of California, remaining for four years and specializing in wood utilization and wood technology.

He then accepted a position as deputy state forester, with headquarters at Sacramento, and has now been advanced to the head of the department. The chairman of the California State Board of Forestry is former Gov. George C. Pardee.

OHIO FEDERATION RESOLUTIONS

The Ohio Federation of Women's Clubs in annual convention in December passed strong resolutions urging the passage of national forestry legislation and pledging its support to the American Forestry Association in its efforts in this field, as follows:

"Whereas, Forest Fires in the United States destroy timber valued at \$20,000,000 every year; and

"Whereas, Industrial demands take forest products four to four and one half times faster than we are producing them; and

"Whereas, The American Forestry Association says a crisis is fast approaching in this country because of lack of a national forest policy the principles of which have already been approved by the General Federation of Women's Clubs; therefore,

"Resolved, By the Ohio Federation of Women's Clubs that we do all in our power to aid the American Forestry Association in its educational campaign looking to the replenishing and perpetuation of our forests."

FOR STATE PARKS

The Natural Parks Association of Washington is campaigning vigorously for the preservation of highway timber and the creation of more state parks throughout the commonwealth. At the annual meeting December 20 last at Tacoma, the association advocated that one or more stands of virgin timber of at least 160 acres each be preserved on each of the main highways; that all of the remaining timber along the Sunset Highway between North Bend and Lake Keechelus be saved, and that at least 10 per cent of the receipts of the state motor vehicle license fund be used in obtaining such park and recreation areas. In all, 24 parks will be acquired and administered by the state parks committee in the near future, if the association's recommendations are carried out. At present Washington has 12 state parks.

The state parks committee is composed of three members, the state treasurer, secretary of state, and the commissioner of public lands. This committee is empowered by statute to set aside timbered portions of state lands adjacent to highways. There is no limit to the areas that may be so reserved. As the state owns considerable stretches of timber bordering various highways, it is anticipated that several suitable park sites will be selected therefrom, thus eliminating the necessity of expending public money for some of the proposed parks.

In addition to the preservation of state timber, the association wants all federal owned timber along highways which traverse the National Forests reserved an

permanently maintained for the recreational use of the public. As the United States Forest Service favors the preservation of the highway timber under its jurisdiction, this aim of the association may eventually be realized.

PINE BLISTER RUST IN BRITISH COLUMBIA

Discovery of white pine blister rust in British Columbia on cultivated black currants by Prof. J. W. Eastham, Provincial Pathologist, British Columbia, is of great importance to the United States because of the extensive and highly valuable western white pine and sugar pine forests in the West. The rust has been found in several localities on Vancouver Island, including Victoria, Nanaimo, Comox, and Courtenay, and on the mainland at Vancouver, New Westminster, Chilliwack, and Agassiz. The discovery of the rust by Professor Eastham was made on September 16, 1921. Since that time the agents of the Office of Blister Rust Control of the United States Department of Agriculture have visited British Columbia to study the distribution of the disease. White pines (*Pinus strobus*), grown from seed in Stanley Park at Vancouver were found diseased. Specimens of these pines were referred to the Department of Agriculture at Washington, D. C. These have been identified as being affected by the white pine blister rust, *Cronartium ribicola*. Further scouting carried on by Federal agents has revealed the rust on cultivated black currants at Sumas City, and Mount Vernon, Washington.

White pine blister was brought to America from Europe during the past 20 years, and has already done much harm. There is widespread infection in the white pine forests of the Northeastern States, and the disease is spreading in Wisconsin and Minnesota.

NEW YORK CITY FORESTERS

The New York Forest Club, consisting of the foresters in and about New York City, has, after a year of informal organization, made itself a definite organization for the discussion of forestry problems, and has elected E. A. Sterling, Chairman, and O. M. Porter, Secretary. The Club will hold monthly meetings, to which all foresters visiting in the city are invited, the meeting date being fixed as the second Tuesday of each month, with a 1 o'clock luncheon at the Yale Club. An effort will be made to have the foresters of the entire country so arrange their visits to New York, when possible, as to be present at this time. It was a surprise to most of those present to learn that in New York district there are about eighty forest school graduates. Several of these are connected with commercial concerns in their professional capacity, especially those in the paper industry which is going more and more deeply into the forestry problem.

HOW DID THEY GET THIS WAY?

By S. C. Martin

This is a long leaf pine, six feet apart at the ground, crossed, but not joined, at a distance of seven feet from the root of the tree, and at a height of thirty feet the two trees are joined together, and as is



THE DOUBLE PINES

"Double Pines" growing on Pine Mountain, in Harris County, Georgia, ten miles from Hamilton, and near Columbus.

shown in the picture, the two trees form one complete tree.

The photograph was furnished AMERICAN FORESTRY by J. O. Martin, of the Department of Education, of Georgia.

FOREST FIRE PROTECTION

The State of Washington spent \$37,000 in 1921, out of a \$100,000 legislative appropriation, for fire protection in the windfall area on the Olympic Peninsula. Approximately eight billion feet of fir, spruce, hemlock and cedar timber, blown down by the tornado of January 29, 1921, served to make a gigantic fire trap covering 2,200 square miles of wilderness bordering the Pacific Ocean. Fire once started there would have caused untold damage before it could have been checked either by human agencies or by burning itself out, the latter the more probable eventuality. But, due to the preventive measures taken by the federal government and the state, the hazard was reduced to a minimum. Jointly with the government, the Washington Forest Fire Association, and the Clallam Lumber Company, the state constructed large water tanks at strategic points along

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the Olympic Highway for 42 miles through the storm zone. These water tanks supplied wagons, which in dry weather wet down the growth beside the roadway. Adequate fire patrols were maintained, and a detachment of National Guard troops regulated tourist travel in the danger area. Stringent fire regulations were rigidly enforced. Smoking was prohibited and no campfires could be kindled except at designated spots.

The coming summer the fire menace will be much more serious than during that of 1921. The dead foliage, needles and wood splinters will be thoroughly seasoned, and the new green growth will not be sufficiently heavy to keep the debris and top soil from becoming exceedingly dry. Safeguards additional to those employed last year are contemplated. The state has \$67,000 to spend during 1922 for continuing and expanding protective work on the Peninsula.

SPARK ARRESTERS

THE Forest Products Laboratory of the Forest Service has undertaken a study of the efficiency of locomotive spark arresters, which is being conducted by Mr. J. S. Mathewson, a mechanical engineer of wide experience. Many spark arresters at present in use are inefficient and comparatively little is known as to their relative value and efficiency. The results of the study will be of far-reaching value, particularly at this time when the impending scarcity of fuel oil is forcing many railroads to revert to coal for fuel.

RECREATION IN THE FOREST

Outdoor recreation ranks today as one of the major resources or utilities of the National Forests, according to Col. W. B. Greeley, Chief of the Forest Service, who states that this is not because of anything the Government has done to facilitate or increase this form of use, but because of the demonstrated belief of several million people that the Forests offer a broad and varied field of recreational opportunities.

According to the figures received from the forests just compiled, there was a total of 973,652 visitors to the National Forests of Oregon and Washington during 1921. The Washington national forests had 550,460, while the Oregon forests had 423,192.

The Forester emphasizes the fact that the presence of large numbers of people on favored recreation areas creates problems of sanitation, of public health, and of protection of public property which can not be safely ignored. He says that counties, municipalities, forest recreation associations and other semi-public organizations and in some cases individual citizens are doing much by generous donations and constructive planning to relieve the situation. They have installed toilets, fireplaces, shelters, sources of water supply, tables and benches, refuse depositories, parking places, and other almost indispensable facilities.

"After the fullest possible co-operation has been secured, however, there will remain many important recreation areas where action by the Government will be necessary to preserve public health and property. The Government should install necessary sanitary and protective facilities upon camp grounds where other means of improvements are unobtainable. The estimate submitted of \$10,000 to meet the cost of work of this kind during the fiscal year 1923 is but a tithe of the amount needed, but it will provide for a few of the most urgent cases.

"The presence of game," the forester points out, "adds to the attractiveness of the National Forests not only to hunters but to residents generally, and anything that contributes to the abundance and variety of game increases the value of the Forests for public purposes. One of the outstanding requirements for the perpetuation of the game resources of the National Forests is a considerable number of small, well-distributed game refuges, within which the rapidly diminishing stocks of valuable mammals and birds may rear their young free from molestation, thus maintaining upon the surrounding lands a normal overflow or drift to supply the hunter, naturalist, and lover of the wild. The National Forests contain many areas remote, inaccessible, and largely unsuited for the grazing of domestic stock, which might

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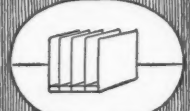
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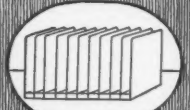
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advantageously be devoted to this purpose. The dedication of such areas to the protection of game would be purely a function of land management, the State's control over the game being unaffected. Several excellent bills are now pending in Congress. A law of this kind, generally applicable to all National Forests, should be enacted.

"Supplementary to the establishment of suitably located game refuges which would serve as breeding places, there should be," declares Col. Greeley, "definitely formulated plans for wild life administration. The animal life of the forests—that is, their native population, beast, bird, and fish—should be regarded and handled in precisely the same way as their plant life, their tree growth and forage growth. Under skillful management the quantity produced can be increased, its kind regulated, and its most desirable utilization secured. Unregulated use means its impairment; intensive use, often its eventual destruction as a resource."

FISH INVESTIGATIONS SHOW SOME OLDER LAKES CONTAIN LESS FISH.

This may be due to untoward changes in breeding areas. Is your lake deteriorating? I examine, report and adjust. Literature on request. **ERNEST CLIVE BROWN**, Box 191 F, Station G, New York City.

NEW YORK'S FIRE LOSSES

A summarization of the statistics compiled by the Conservation Commission for the past year, shows 1921 to have been the most serious fire year since 1903 and 1908, but the very effective protection accorded kept the losses at a minimum. The figures show that with a total of 633 fires, and an area of 26,663 acres burned over, the total loss amounted to only \$49,920, and the entire expenditure for fighting fire for the year came to \$62,812.88.

STANDARDIZATION OF WOOD-TESTING METHODS

The American Society for Testing Materials and the U. S. Forest Service have been designated by the American Engineering Standards Committee as joint sponsors for the development of uniform standard methods of testing wood. This action was taken as the result of a canvass made of the principal national bodies concerned with the proposed project, from which it was apparent that there is a real demand for the work, and that the joint sponsorship here indicated would be acceptable to the industry.

14,000 FIRES IN PULPWOOD FORESTS

There were 14,463 forest fires in the pulpwood regions of the United States during 1920, burning over 2,059,408 acres, according to a report compiled by the Woodlands Section of the American Paper and Pulp Association, in co-operation with the United States Forest Service.

The tremendous losses by fire tremendously handicap the paper manufacturers in their efforts to determine a future forest policy for this industry, for the problem of artificially planting new forests would be enormously minimized if the loss by fire in growing forests could be eliminated.

In the New England states alone there were 2,419 fires, of which 1,619 were in Massachusetts, 164 in Maine, 542 in New Hampshire, 54 in Vermont and 40 in Rhode Island. The area burned over in Maine was the largest of this group, being 39,803 acres. Fires this year have done even more damage, though no figures are yet available, and the same is probably true of New York. Here there were 479 fires in 1920, burning 35,176 acres.

In the group of states including Pennsylvania, Maryland, Ohio, Virginia, West Virginia, North Carolina and New Jersey there were 4,928 fires, of which 1,597 were in Pennsylvania and 1,644 in North Carolina, 716,863 acres.

In the lake states of Michigan, Wisconsin, Minnesota, there were 776 fires, burning 114,000 acres. The total area burned over was 597,910 acres, and in the great forest states of Washington, Oregon and California, there were 4,861 fires, burning 646,648 acres.

The total damage by these fires throughout the country was \$6,319,641.

Col. W. B. Greeley, Chief Forester of the United States Forest Service, has said that if the forest fire menace could be eliminated, the problem of future forests for the country would be greatly simplified.

QUARANTINE AGAINST SATIN MOTH

A Federal quarantine, effective January 1, against New Hampshire and Massachusetts to prevent the spread of the satin moth, a dangerous insect pest newly discovered in this country, has been announced by the Federal Horticultural Board, United States Department of Agriculture. The action by the department follows a hearing held here in December, when various phases of the situation were discussed.

WANTED

Pine Cones, green or brown, still on the trees and closed, containing seed. Will pay \$3.00 a bushel picked and sacked; extra for bags; Hemlock and spruce less in proportion. Telephone Elmsford 1710 or write P. O. Box 231, White Plains, N. Y.

ATTENTION, FORESTERS

AMERICAN FORESTRY will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters. This privilege is also extended to foresters, lumbermen and woodsmen, discharged or about to be discharged from military service, who want positions, or of persons having employment to offer such foresters, lumbermen or woodsmen.

POSITIONS WANTED

POSITION wanted as Forester or Superintendent on a private estate or otherwise, by a thoroughly practical, experienced, married man. English. Competent to take charge of any foresters' post in every detail. Can undertake the control of a saw mill; building roads, nursery work, landscape planting, tree work, and handling help. Good references. Address Box 3040, care **AMERICAN FORESTRY MAGAZINE**, Washington, D. C. (1-3-22)

FORESTER—Experienced in cruising and general woods work, also Aerial Photograph Interpretation, would like position with Pulp or Lumber Company. Address Box 3045, in care **AMERICAN FORESTRY MAGAZINE**, Washington, D. C. (1-3-22)

WINTER POSITION wanted with lumber company as time keeper or similar work. Graduate of high school and ranger course, 25 years old, good references from previous employers. Address Box 3030, care **AMERICAN FORESTRY MAGAZINE**, Washington, D. C. (10-12-21)

FORESTER—Graduate of Penn State, 28 years of age, desires work in Forestry or allied lines. Varied experience in Forestry and lumbering. Served with 10th Engineers and with Wood Supply Branch in France. Will consider any outdoor work with a future. Address Box 3035, care **AMERICAN FORESTRY MAGAZINE**, Washington, D. C. (10-12-21)

POSITION WANTED BY TREE SURGEON.—Ex-service man wishes employment with some tree surgery company; 37 years old and can do any kind of tree surgery work. Can handle men and also understand landscape work. Address Box 3055, care **AMERICAN FORESTRY MAGAZINE**, Washington, D. C. (2-4-22)

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KILN DRYING COURSE

Since the announcement of the correspondence-study course Kiln Drying of Lumber by the Extension Division of the University of Wisconsin less than two years ago, almost 400 persons have enrolled. This course has been developed through co-operation of the United States Forest Products Laboratory. Men from 37 States of the Union and seven foreign countries have taken up this mail instruction to learn more about the art of operating dry kilns, and the proper handling of lumber in general.

This correspondence-study course is an outgrowth of the resident short courses which have proved so successful at the United States Forest Products Laboratory, located on the University campus. It was early recognized that much of the information on improved methods of kiln drying could be taught by mail. Many men who cannot avail themselves of the class instruction in Kiln Drying given at regular intervals at Madison enroll for the correspondence-study course and so obtain valuable information upon the latest developments in the seasoning of wood.

ALASKA ONCE SUBTROPICAL

The ancient vegetation of the Arctic region, as is shown by a study of its fossil plants, indicates that its climate was once very unlike that which prevails there now. Instead of consisting of a handful of small plants struggling for life amid snow and ice in a scant, almost perpetually frozen soil, its vegetation was abundant and luxuriant and included ferns and palmlike plants that grow only in a mild and probably frostless climate. This vegetation flourished in the Arctic region from at least late Paleozoic to middle Cenozoic geologic time, millions of years ago, before man existed. Although these lands are now so inhospitable and are rarely visited, the United States Geological Survey has gathered a large amount of information concerning their fossil floras.

A study of the coal beds of the Cape Lisburne region has incidentally disclosed many fossil plants. These coal beds are extensive and are the only known commercially valuable mineral resources of that region. A little coal is occasionally mined for vessels that are short of fuel, which, as there is no harbor, lie offshore and perilously load on a few sacks of coal by means of lighters.

Cape Lisburne is the bold headland which marks the northwest end of a land mass that projects into the Arctic Ocean from the western coast of Alaska about 160 miles north of the Arctic Circle and about 300 miles directly north of Nome. Even Cape Lisburne is by no means the northern limit of the fossil plants of this nearly tropical vegetation, for they have been found in the rocks 180 miles northeast of Cape Lisburne.

"FORESTRY LECTURES"

The public lecture courses given by the New York State College of Forestry are being arranged for the winter and spring seasons.

Last year the college staff gave 234 talks on forestry and related subjects throughout 41 counties in the State of New York and reached 63,000 people. At the same time many communities requested lectures which could not be given, owing to limited funds and lack of time.

This year the college is offering the same service. Talks will be given, illustrated by lantern slides where possible, on such subjects as "The Forest of New York," "Farm Forestry," "A National Need—Forestry," "The Life and Work of a Forester," etc. Prof. Arnold, of the Landscape Extension Department, will speak on subjects relating to civic improvement, ornamental trees, parks and other landscape matters. Prof. H. L. Henderson is prepared to talk at some of the important wood-working centers of the State on various practical phases of lumber kiln drying practice.

Lectures are given free wherever four or five lectures can be arranged in one county in one trip. Each organization is requested to guarantee an audience of fifty persons. These requirements have been made necessary in order to obtain a more judicious use of college lecture funds and to reach the largest number of people in a given period.

MAINE FORESTRY ASSOCIATION

The Maine Forestry Association met in annual convention January 6-7, and a full and valuable program was presented. The sessions were well attended by enthusiastic people and much was accomplished. The Association in its closing session on Saturday at the State House expressed in resolutions its strong opposition to the proposed transfer of any part of the United States Forest Service from the Department of Agriculture to any other department. It also urged that the Legislature of the State of Maine provide ample to develop the State School of Forestry to full technical and practical efficiency in order to make possible the training of young men in forestry within the State and to provide the public institution in forestry. The final session was marked with interest and enthusiasm in the topics presented for discussion, and a very profitable and instructive program was carried out. Undoubtedly it was the most successful and valuable convention ever held in the interests of forestry in the State.

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